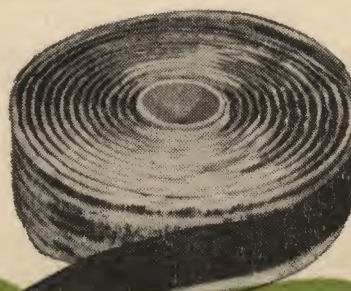
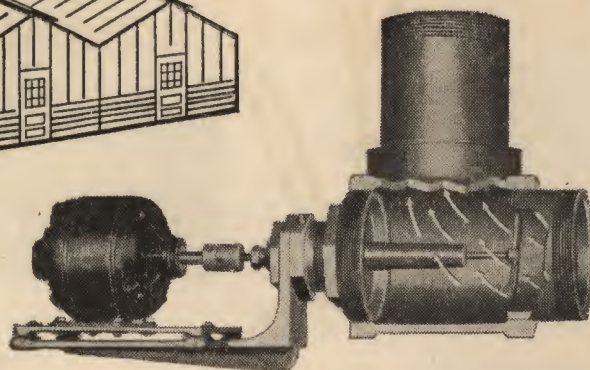
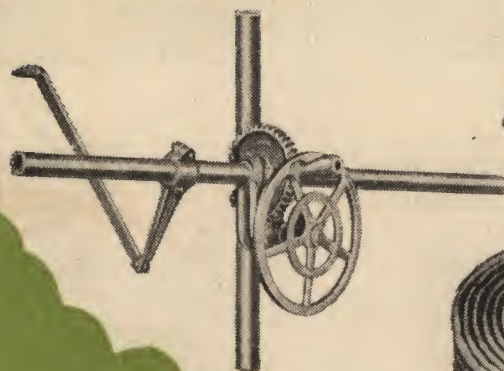
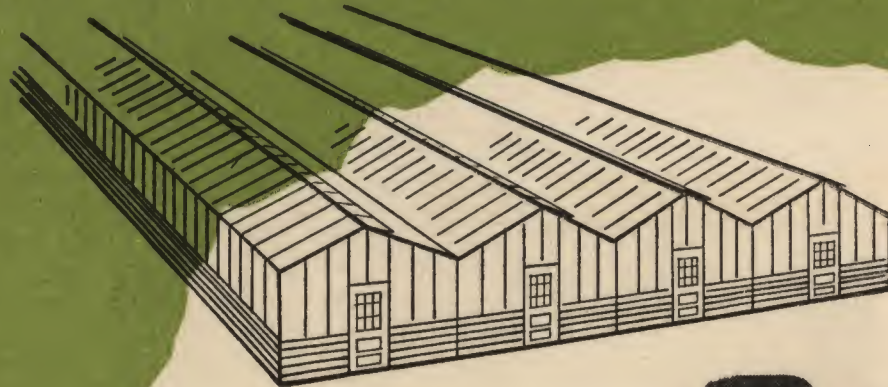




*Model  
File*

# NATIONAL GREENHOUSE CO.

GREENHOUSES • ACCESSORIES • PARTS



MAIN OFFICE AND FACTORY

OFFICE AND WAREHOUSE

PANA, ILLINOIS

NAUGATUCK, CONN.

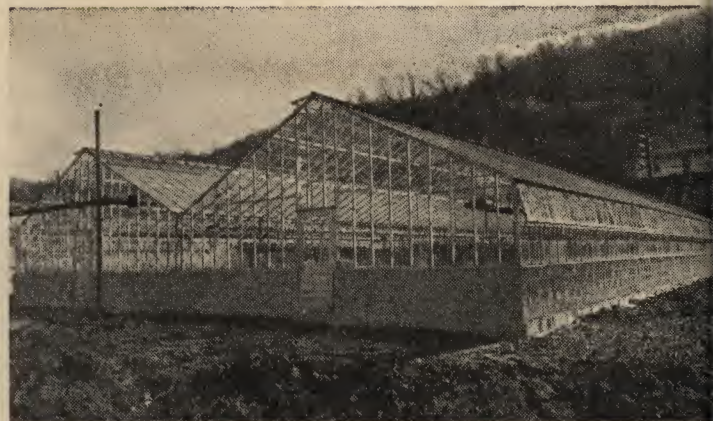


FROM COAST TO COAST

# NATIONAL INSTALLATIONS SERVE A *Growing* INDUSTRY



21'1" x 67'0" Model No. 8 *National* greenhouse owned by Mrs. Sara Mathews Britt of Thomaston, Georgia.



Two 28' 0" x 100' 4" Model No. 8 Duplex Steel Gutter connected *National* greenhouses. Owned by the Norton Floral Company, Norton, Va.



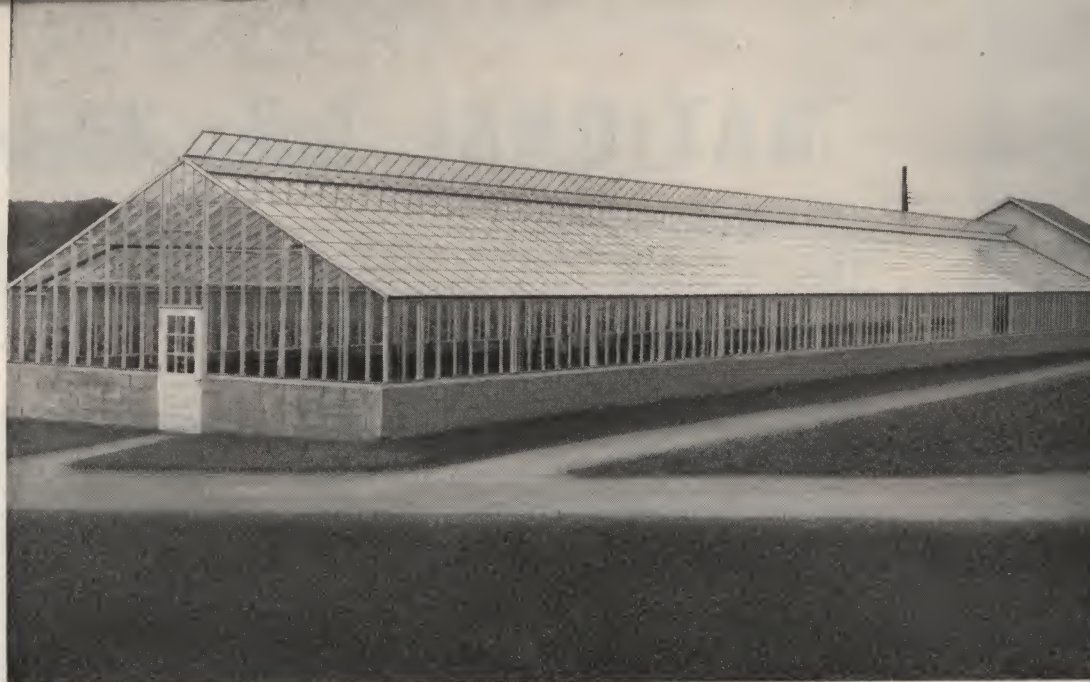
28' x 142'. Model No. 8 *National* greenhouse built at Kenner, La. by Max Scheinuk of New Orleans. Note door arrangement to permit easy entrance by wider equipment.

Interior view of a 28' x 100' Model No. 8 *National* greenhouse built for John J. Zapadka, Woodland Gardens, Manchester, Conn.



A 12' x 28' leanto and 24'6" x 75'4" Model No. 8 *National* greenhouse, connected with duplex steel gutter. Brush Greenhouse, Brush, Colorado are the owners.





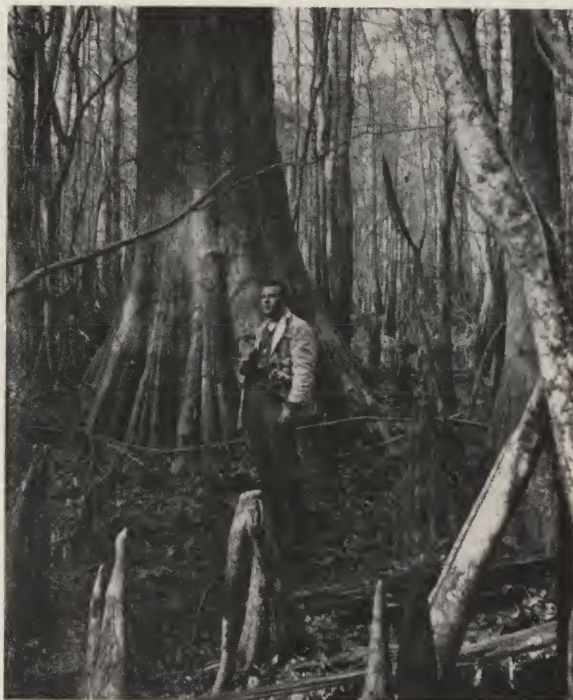
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# NATIONAL *Talks About Wood*

"The woods which hold paint longest and suffer least when repainting is neglected are . . . cypress and redwood." This excerpt from the Paint Manual of the U. S. Department of Commerce, National Bureau of Standards, is indicative of the importance in choosing the proper lumber for greenhouse construction.



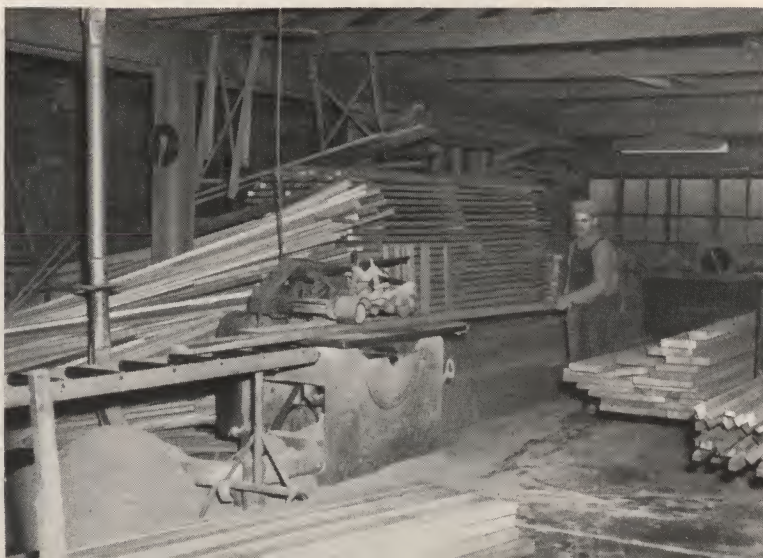
Tidewater Red Cypress



California Redwood

Almost exclusive use of genuine Tidewater Red Cypress and California Redwood by greenhouse owners throughout the nation is conclusive proof that these are the finest, most durable greenhouse building materials. Genuine Red Cypress and California Redwood acquire a satin-smooth finish when milled. A finish that paint easily takes to . . . and stays longer, improving their natural weather and rot-resisting qualities.

Pictured below is a phase of the woodworking operation at National's Pana, Illinois plant. Quality materials combined with experienced workmanship assure you of the finest in greenhouse construction.



## Wood Guarantees

The manufacturers of National greenhouses guarantee that the wood members included in this catalog are made of Genuine Red Cypress or California Redwood. Your assurance of long, repair-free service.

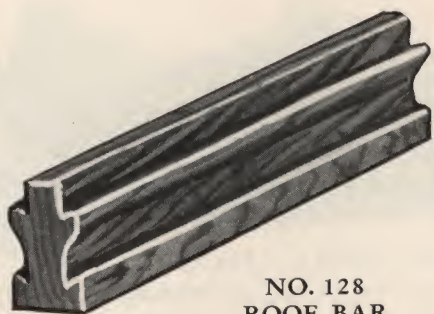
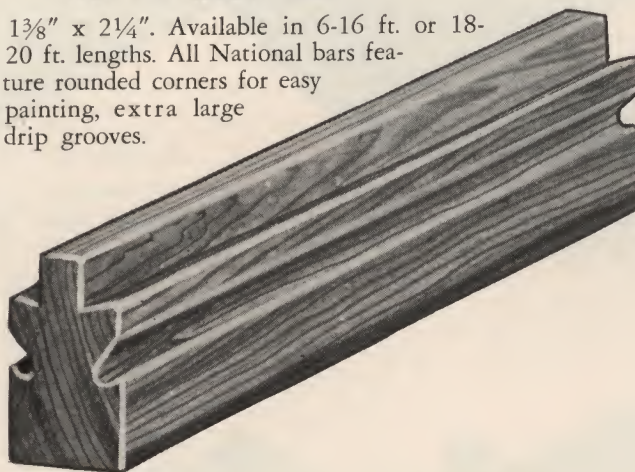


# CYPRESS OR REDWOOD *FOR THE BEST IN WOODWORK...*

If you're thinking of building a new greenhouse or of repairing a present one, you must be certain of the long-lasting qualities of the wood which goes into such a project. Genuine Red Cypress and California Redwood are your assurance of the finest woodwork obtainable. When ordering, remember that all lumber is sold in multiples of two ft., i.e., 2', 4', 10', 12', etc.

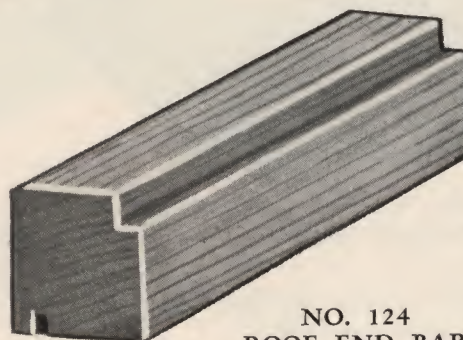
**NO. 122 ROOF BAR**

1 $\frac{3}{8}$ " x 2 $\frac{1}{4}$ ". Available in 6-16 ft. or 18-20 ft. lengths. All National bars feature rounded corners for easy painting, extra large drip grooves.



**NO. 128  
ROOF BAR**

1 $\frac{3}{8}$ " x 2 $\frac{1}{4}$ ". Designed especially for use on National Wonder houses. The low drip groove fits up under the higher one in the No. 122 pattern, forming a non-leaking splice. A National exclusive!



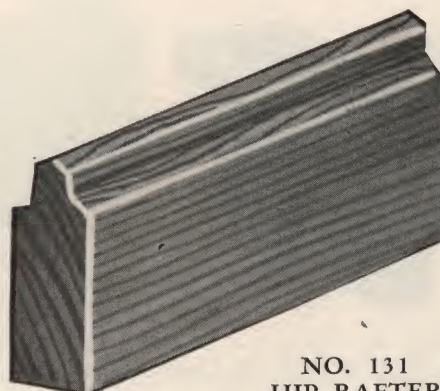
**NO. 124  
ROOF END BAR**

2 $\frac{1}{4}$ " x 2 $\frac{1}{4}$ ". This is the last bar on the roof at each end of the greenhouse. The upright gable bars are nailed to the underside of this bar which is grooved to receive the gable glass.



**NO. 132  
VALLEY RAFTER**

2-5/16" x 3-1/4". This sturdy bar is designed for use in the valley where the roofs of two greenhouses are joined.



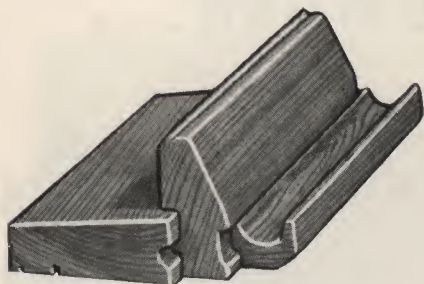
**NO. 131  
HIP RAFTER**

1 $\frac{3}{8}$ " x 3 $\frac{1}{2}$ ". The hip rafter is used where the outside roof slope of two greenhouses join together.



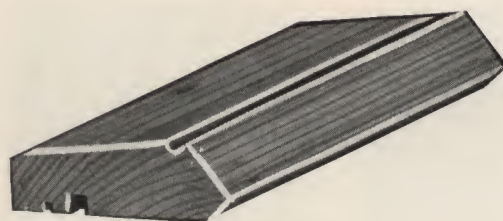
# NATIONAL MOLDINGS

*The Hallmark of Quality*



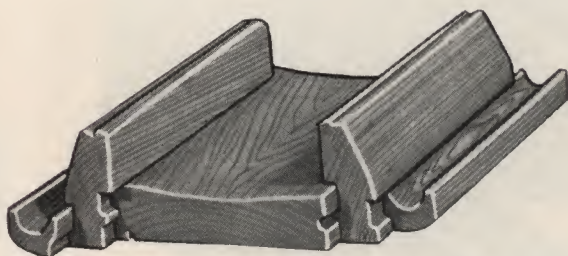
**NO. 168 EAVE**

Three-piece. Plate,  $1\frac{3}{4}$ " x  $4\frac{1}{2}$ "; Sill,  $1\frac{3}{4}$ " x  $3\frac{3}{4}$ ", and Drip,  $1\frac{3}{8}$ " x  $1\frac{3}{4}$ ".



**NO. 100 EAVE**

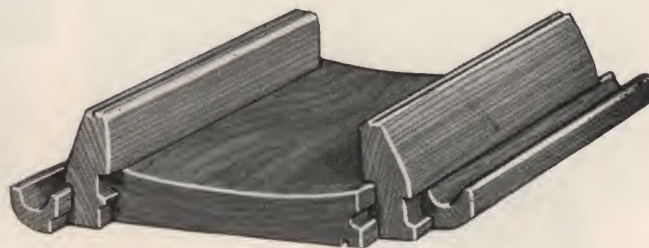
$1\frac{7}{8}$ " x  $5\frac{3}{4}$ ". Strong, inexpensive one-piece eave. Used on all model No. 9 National greenhouses.



**NO. 103 "TEN INCH" GUTTER**

Bottom,  $1\frac{3}{4}$ " x  $7\frac{1}{2}$ "; Sill,  $1\frac{3}{4}$ " x  $3\frac{3}{4}$ ", and Drip,  $1\frac{3}{8}$ " x  $1\frac{3}{4}$ ".

If it is desired to carry roof water away, gutters should be used rather than eaves.\*



**NO. 104 "TWELVE INCH" GUTTER**

Bottom,  $1\frac{3}{4}$ " x  $9\frac{1}{2}$ "; Sill,  $1\frac{3}{4}$ " x  $3\frac{3}{4}$ ", and Drip,  $1\frac{3}{8}$ " x  $1\frac{3}{4}$ ".

If it is desired to carry roof water away, gutters should be used rather than eaves.\*

\*Gutter may be pitched for easy drainage of roof water.



**NO. 167 RIDGE & CAP**

Cap,  $1\frac{3}{8}$ " x  $3\frac{1}{4}$ ". Ridge,  $1\frac{3}{8}$ " x  $3\frac{3}{4}$ ". Most popular wood ridge made. A ridge with a cap is a necessity when vents are used on both sides.

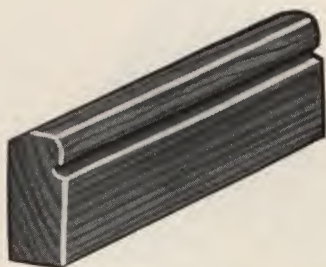


**NO. 167A LEANTO  
RIDGE AND CAP**

Cap,  $1\frac{3}{8}$ " x  $2\frac{1}{4}$ ". Ridge,  $1\frac{3}{8}$ " x  $3\frac{3}{4}$ ". This ridge and cap are designed for use on all leanto greenhouses.



# For Years and Years of Service!



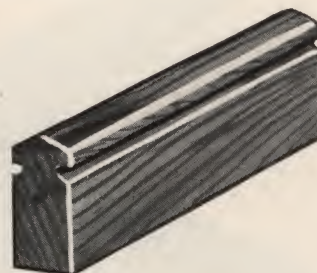
**NO. 169 RIDGE**

1 $\frac{3}{8}$ " x 2 $\frac{7}{8}$ ". Specially designed for use with National's hookover type steel framed sash.



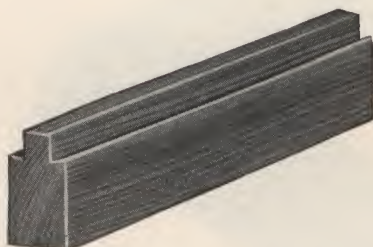
**NO. 135 RIDGE**

1 $\frac{3}{8}$ " x 4 $\frac{1}{8}$ ". Designed for use with National steel ridge cap only.



**NO. 137 RIDGE**

1 $\frac{3}{8}$ " x 2 $\frac{7}{8}$ ". This ridge designed especially for passage or other type houses where ventilators may not be desired.



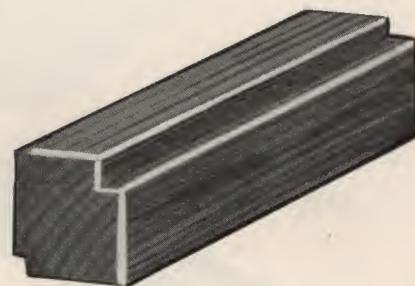
**NO. 117 GABLE BAR**

1 $\frac{3}{8}$ " x 2 $\frac{1}{4}$ ". Available in lengths from 3 to 16 ft. Figure the lengths you need or send a sketch of the gable as you want it and we will figure bars to suit.



**NO. 119 GABLE BAR**

1 $\frac{3}{8}$ " x 2 $\frac{1}{4}$ ". 3 to 16 ft. lengths. Designed with a glass groove on one side only.



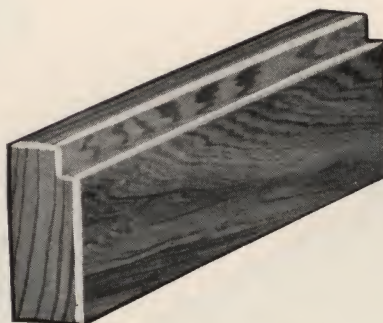
**NO. 162 CORNER BAR**

2 $\frac{1}{4}$ " x 2 $\frac{1}{4}$ ". Use at end of house. Wall glass fits into one side and gable glass the other.



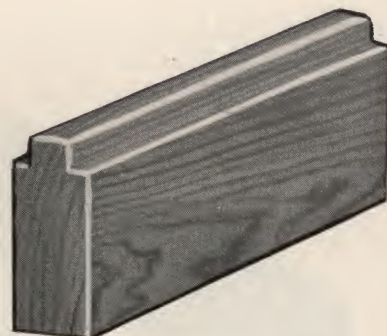
**NO. 118 SIDE WALL BAR**

1 $\frac{3}{8}$ " x 1 $\frac{3}{4}$ ". 1 thru 4 ft. lengths. At small cost, we will cut bars to fit sill. If more than 4 ft. of glass is to be used in the side wall, you should use No. 117 bars.



**NO. 157 GABLE BAR**

1 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ ". 8 thru 16 ft. lengths. Similar to No. 158 Gable Bar, except that there is a glass groove on one side only.



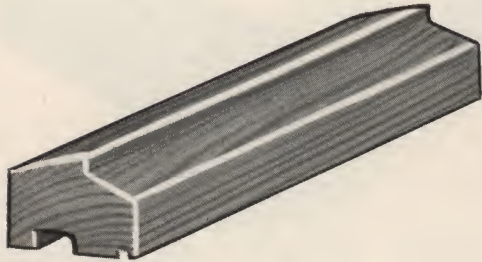
**NO. 158 GABLE BAR**

1 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ ". Lengths from 8 thru 16 ft. This heavy bar is used as a gable column.



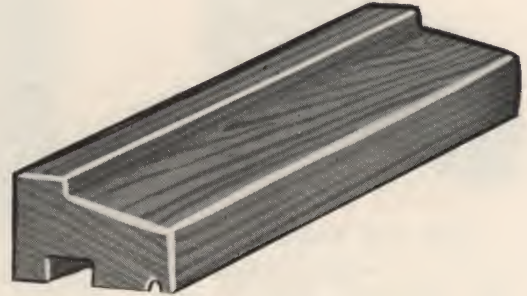
# CYPRESS AND REDWOOD

## *Strength and Lasting Quality*



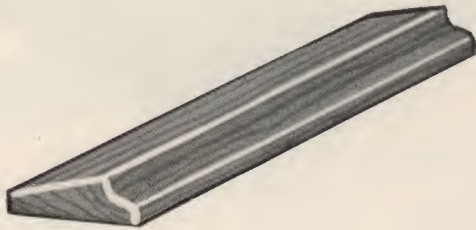
**NO. 113 GLAZING SILL**

1 $\frac{3}{4}$ " x 2 $\frac{3}{4}$ ". This sill should be used on side walls and gables, where movable sash will not be used.



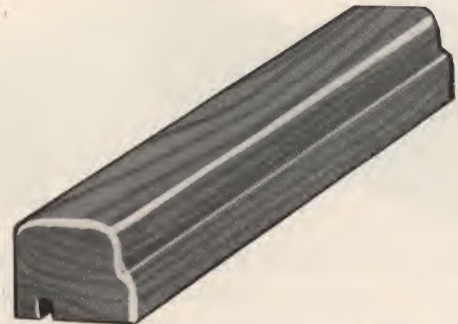
**NO. 114 SASH SILL**

1 $\frac{3}{4}$ " x 2 $\frac{3}{4}$ ". This sill is used only when you have movable side sash.



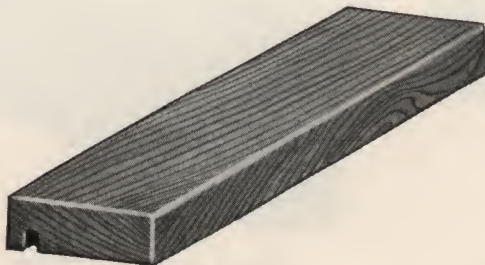
**NO. 130 GLAZING SILL**

$\frac{3}{4}$ " x 2 $\frac{1}{4}$ ". A small glazing sill with many miscellaneous uses in cases where a light glazing member is sufficient.



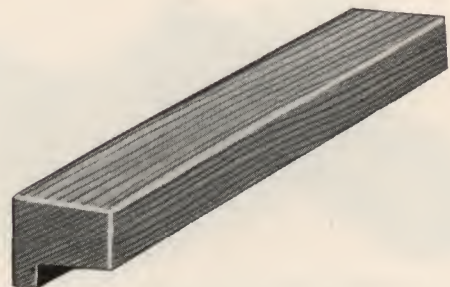
**NO. 182 STEEL "T" SILL FASCIA**

1 $\frac{3}{8}$ " x 1 $\frac{3}{4}$ ". This wood fascia is used under National steel "T" sill, where fixed glass will be used below the sill.



**NO. 134 GLASS FASCIA**

$\frac{3}{4}$ " x 2 $\frac{1}{4}$ ". A general molding for receiving glass. A variety of uses.

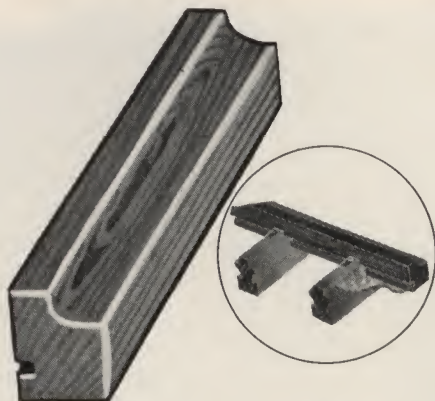


**NO. 138 TOP RAIL**

1 $\frac{3}{8}$ " x 1 $\frac{3}{4}$ ". Place this molding under flat bottom wood gutter or eave to serve as a top rail for hanging wood sash.

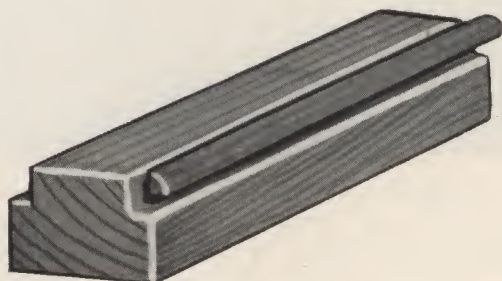


# GENUINE RED CYPRESS OR CALIFORNIA REDWOOD



**NO. 127 HEADER**

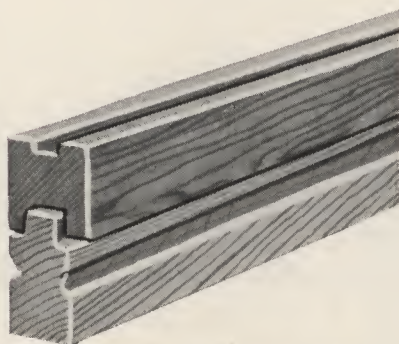
1 $\frac{3}{8}$ " x 1 $\frac{3}{4}$ ". One of two styles available. Runs along roof for lower edge of vent to close on. Can be furnished notched, ready to set over roof bars.



**NO. 176 SIDE BAR**

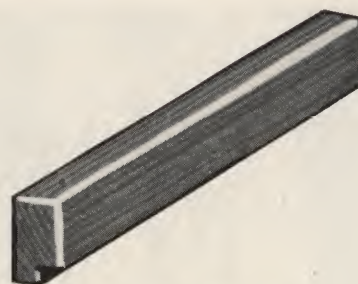
**NO. 179 GLASS MOLDING**

No. 176 side bar, 1 $\frac{3}{4}$ " x 2 $\frac{3}{4}$ ". This bar should be used with the 3/16" crystal sheet glass. No. 179 glass molding, 5/16" x 5/16". For fastening 3/16" glass in place.



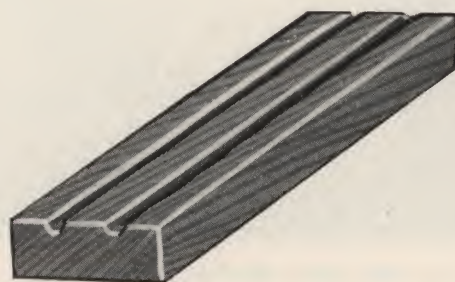
**NO. 148 WEATHER STRIP**

1 $\frac{3}{8}$ " x 1 $\frac{3}{4}$ " x 29" used on the roof between runs of wood sash to close up the wedge-shaped space against the weather.



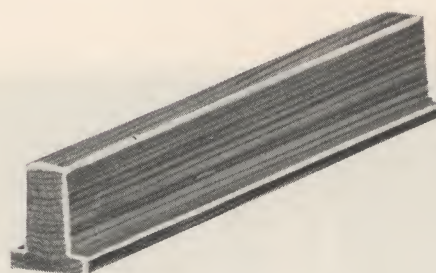
**NO. 142 HEADER**

3/4" x 1 $\frac{3}{8}$ ". Used in a similar manner to the No. 127 header. Can also be shipped notched, ready to set over roof bars.



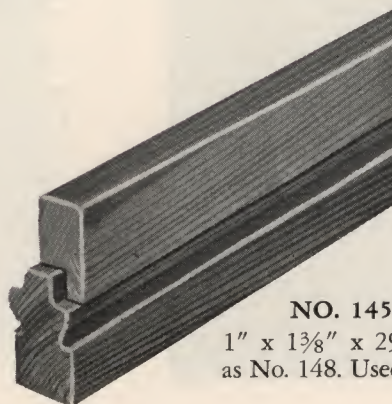
**NO. 164 DOOR AND SASH  
ASTRAGAL**

3/4" x 2 $\frac{1}{4}$ ". For use on double doors or gable filling sash.



**NO. 140 DIVIDER BAR**

1 $\frac{3}{4}$ " x 1 $\frac{3}{4}$ ". Used in the sidewall between runs of wood ventilators.



**NO. 145 WEATHER STRIP**

1" x 1 $\frac{3}{8}$ " x 29". Serves the same purpose as No. 148. Used at ends of skip-a-light sash.



# YOUR ASSURANCE OF THE FINEST . . . .



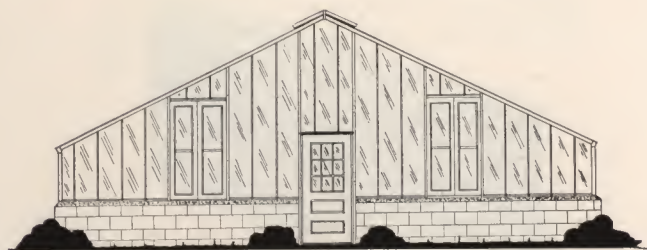
**NO. 300 SIX-LIGHT DOOR**

2'6" x 6'6". Made of genuine California Redwood, these six-light doors were designed especially for greenhouse use. Sturdy construction throughout, guaranteed for long life.



**NO. 301 NINE-LIGHT DOOR**

3' x 6' or 3' x 6'6". Nine-light greenhouse doors by National are built better to last longer. The "nine-light" feature minimizes glass breakage; improves the beauty of your house.

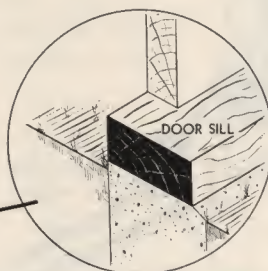
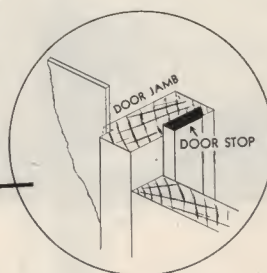
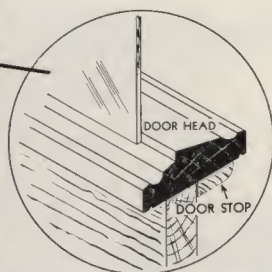


**NO. 302 GABLE FILLING SASH**

1'8" x 6'. Gable filling sash are convenient for growers who move bench soil in and out of the greenhouse. Oftentimes used in gables where no door is required or in conjunction with a door in wide houses. Gable opening is 3'4" x 6'. (A frame will be required to support the gable filling sash. See item No. 304 on following page.)



# ..... BY NATIONAL



## NO. 303 DOOR FRAME

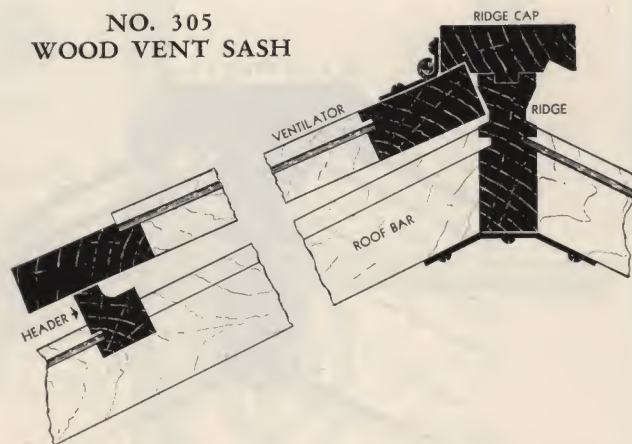
No door is better than its frame. These frames have sturdy uprights made from 2x4. The head is drip proof with inside and outside drip gutter. Sill is made from 2x4. Stops are full thickness and ample width. Frames furnished with jambs in 8, 10, 12, 14 and 16 ft. lengths.

## NO. 304 GABLE FILLING SASH FRAME

Frame similar to No. 303 can be supplied for gable filling sash. This frame is designed to hold one pair of sash. Frames furnished with jambs in 7, 8, 10, 12 and 14 ft. lengths.



## NO. 305 WOOD VENT SASH



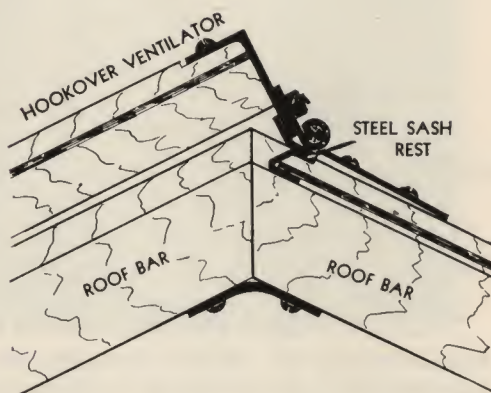
Standard ventilator depth, 29". Three, four, five or six light sash can be furnished. All sash arranged for 16" x 24" glass. Choice of sash depends upon the arrangement you desire and the amount of air you wish in your house. The six-light sash are made up in continuous runs on the roof, while the other sash are spaced with one row of roof glass left in between, or even two or more lights may be skipped.



# No. 306 Steel Frame Roof Ventilator

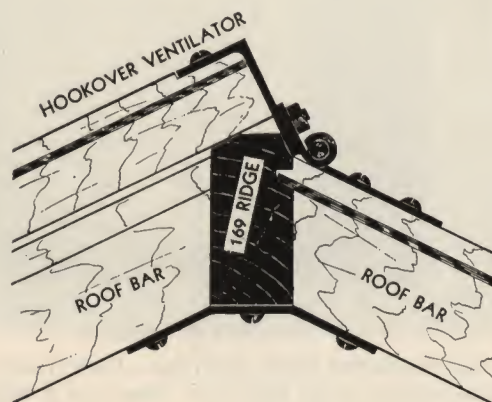


Cypress or redwood glazing bars framed with galvanized angle top and bottom rails form the basic parts of National's exclusive steel frame ventilators. Now you can have one continuous sash the length of your house. Adaptable for use on one or both sides of roof with several types of ridge. All sash made up in six-light sections, (8'4") for full lights of 16" x 24" glass. Shipped complete with splices, hinges, zinc strips, weather strips, glass stops, bolts and screws. Lifter arm lugs are bolted to the steel bottom rail.



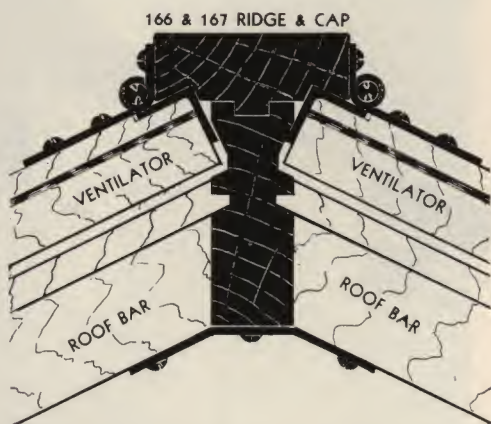
## HOOKOVER VENT FOR STEEL RIDGE

When hookover vent is used with National steel ridge a sash rest is necessary, (see Page 15). Bars must have  $\frac{5}{8}$ " wide tongues,  $\frac{1}{2}$ " deep, and spaced 16-11/16" on centers.



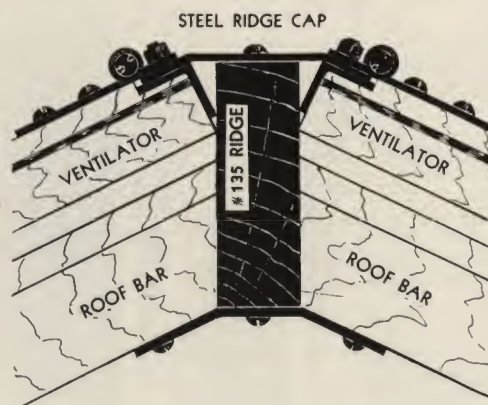
## HOOKOVER VENT FOR WOOD RIDGE

When hookover vent is used with No. 169 wood ridge, bars must have  $\frac{5}{8}$ " wide tongues and must be spaced 16-11/16" on centers (correct spacing when 16" glass is used) in order to attach the hinges. Top angle on vent hooks over ridge and seals out weather.



## RIDGE/CAP VENT FOR WOOD RIDGE AND CAP

Vent is hinged to cap. When this type vent is used with wood cap, glass spacing on house is of small importance because vent hinges can be fastened any place along the cap. Ridge and cap should be used whenever you plan to use two ventilators at the ridge.

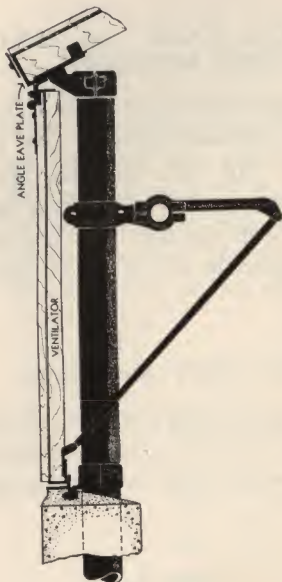


## RIDGE CAP VENT FOR WOOD RIDGE AND STEEL CAP

This is the strongest ridge and vent connection available and we suggest its use whenever possible. Vent hinges bolt directly to the steel cap. (See steel ridge cap on Page 15.)

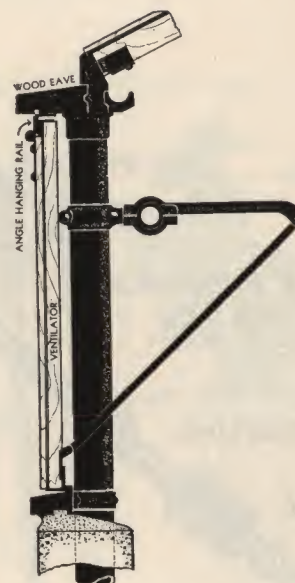


# No. 307 Steel Frame Side Ventilators



National steel frame side ventilators are constructed similar to the steel frame roof ventilators, and are available in both 24 and 36 inch depths. They are designed to be hung under a National angle eave plate or under an angle top rail attached to the bottom of a flat wood gutter or eave. (See Page 14 for a full description of the No. 330 angle eave.)

No. 308 angle top rail, for use as described above, is furnished in 8'4" sections, complete with bolts and screws. Hinge holes are drilled in the top rail to receive the ventilator hinge bolts. Easily installed on any wood gutter or eave.

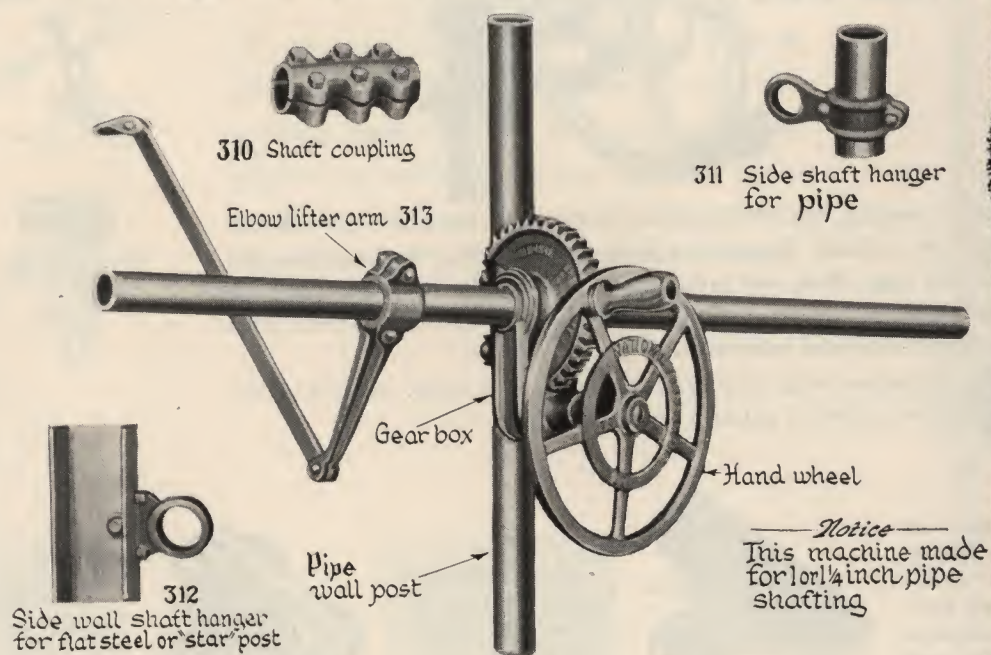


Two-light steel frame side ventilators can be installed in the sidewall of any greenhouse. They offer an inexpensive method of obtaining side ventilation. Available in 24 and 36 inch depths. Complete with hinges, zinc strips, glass stops, bolts and screws. Push rods and two-light sash adjusters can also be furnished.

## NATIONAL Vent Lifting Equipment

### NO. 309 SIDE VENT MACHINE

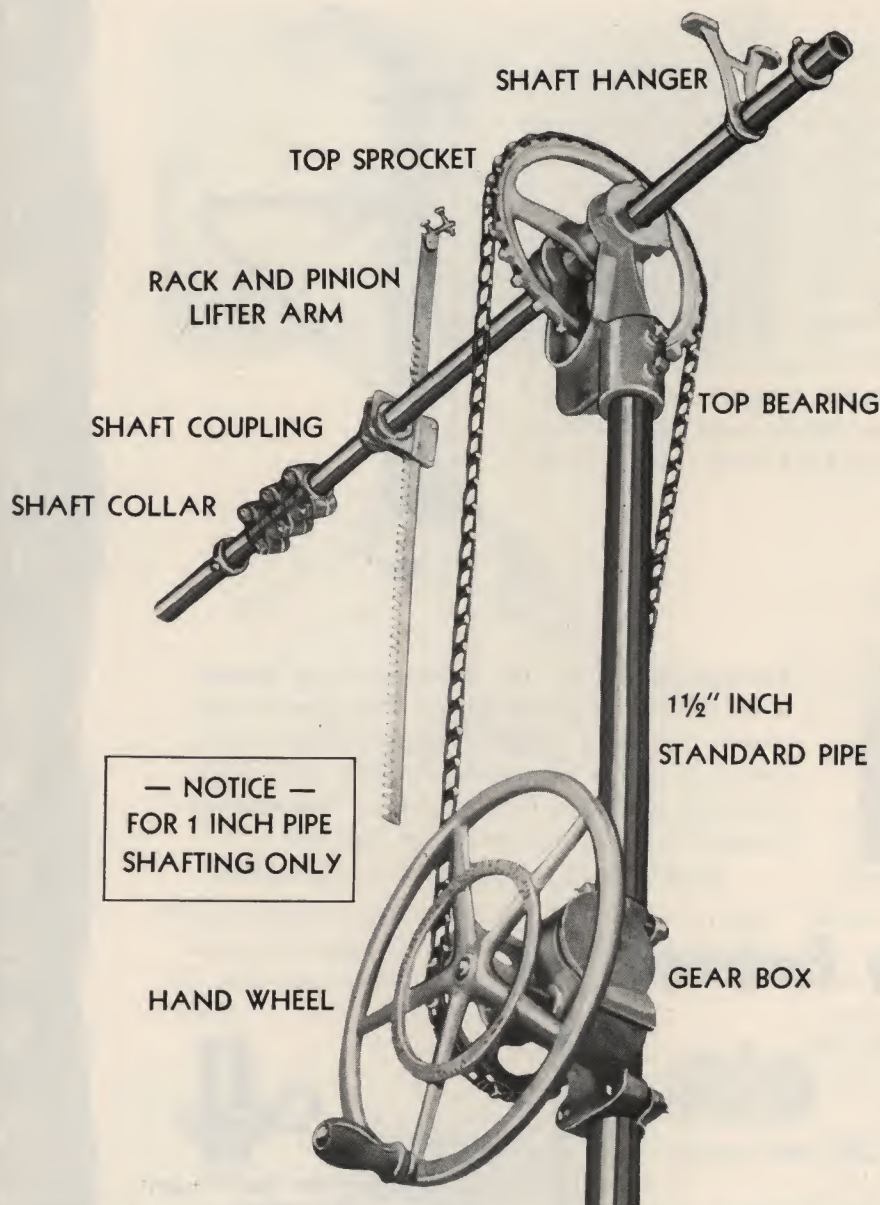
For runs up to 75 ft. in length. Designed to clamp on 1½" or 2" pipe or flat steel post and turn 1" or 1¼" pipe shafting. Worm and gear mesh in grease reservoir. Large hand wheel fits close to gear box to conserve space in walk.



No. 310 shaft couplings, No. 311 side shaft hangers for pipe post, No. 312 side shaft hangers for flat steel or "star" post, and No. 313 elbow lifter arms are available for use with the No. 309 side vent machine. See price list for the size you require.



# NATIONAL Vent Lifting Equipment . . .



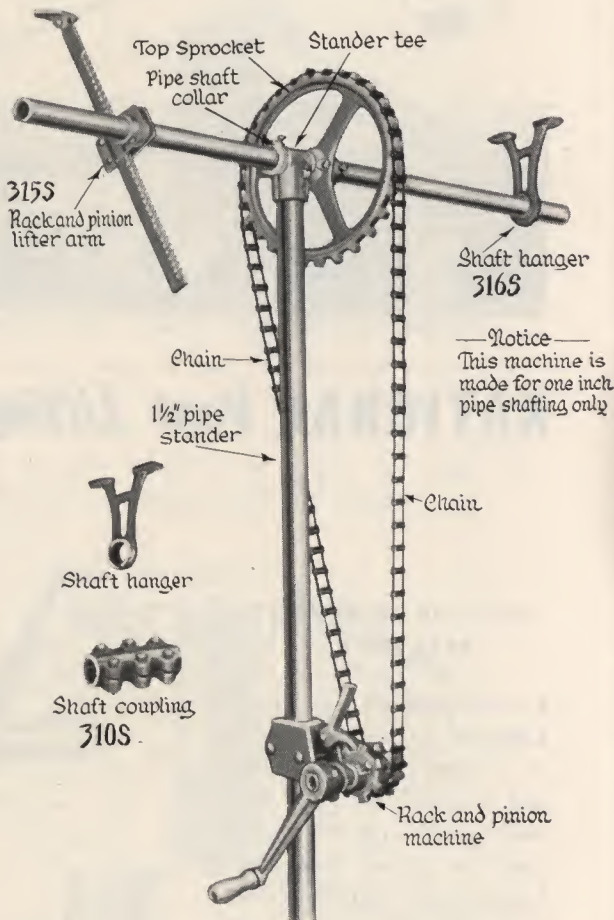
— NOTICE —  
FOR 1 INCH PIPE  
SHAFTING ONLY

## NO. 314 NATIONAL RACK and PINION VENT MACHINE

Cut steel worm and gear, operating in an enclosed grease case, make up the basic parts of this easy-operating, heavy duty roof vent machine. Special design of top bearing assures firm support for shafting without binding. Top sprocket will not slide. One machine will operate up to 150 ft. of sash in one run.

## NO. 317 PANA VENT MACHINE

This inexpensive rack and pinion machine will operate up to 125 ft. of sash in one run. Large, crank-type handle permits maximum leverage for easy operation.



— Notice —  
This machine is  
made for one inch  
pipe shafting only

No. 310 shaft coupling, No. 315S rack and pinion lifter arm and No. 316S roof shaft hanger are available for use with both the rack and pinion machines described on this page. Rack and pinion type arm permits maximum load lift with a minimum twist on the shafting or effort by the operator. Consult price list for sizes and additional information required.

Machines are furnished with sufficient chain for a 12 ft. ridge. Additional No. 320 chain can be ordered if required.

No. 318 Splice and Lifter Arm Lug for National steel frame sash. Furnished complete with bolts and rivet.



No. 319 Lifter Arm Lug for wood sash. Furnished complete with bolts and rivet.



No. 320 Chain for use on Pana and National Rack and Pinion Roof Vent Machines.



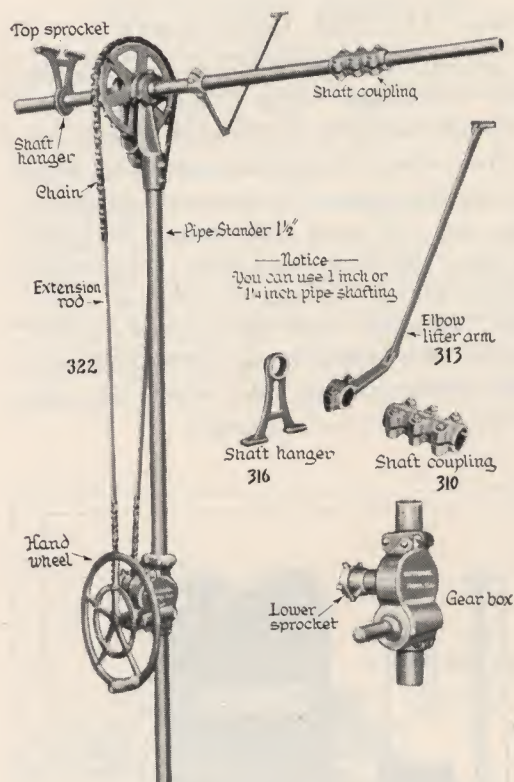


# ... To Fit Your Requirements

No. 310 shaft couplings, No. 313 elbow lifter arms and No. 316 roof shaft hangers are available for use with the machines described on this page. Machines are furnished with sufficient chain, or chain and extension rod, for a 12 ft. ridge. Additional chain or longer extension rods available if required. The elbow type lifter arm is designed for quick operation. See price list for sizes and additional information required.

## NO. 310 CHAIN PULL VENT MACHINE

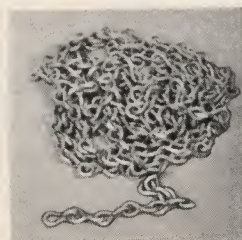
Use this machine for runs of roof sash, up to 33 ft. For use with 1" or 1 1/4" pipe shafting and elbow type lifter arms. Worm and gear mesh in a grease reservoir. Fastens to roof bar at pitch desired. No pipe column necessary for support.



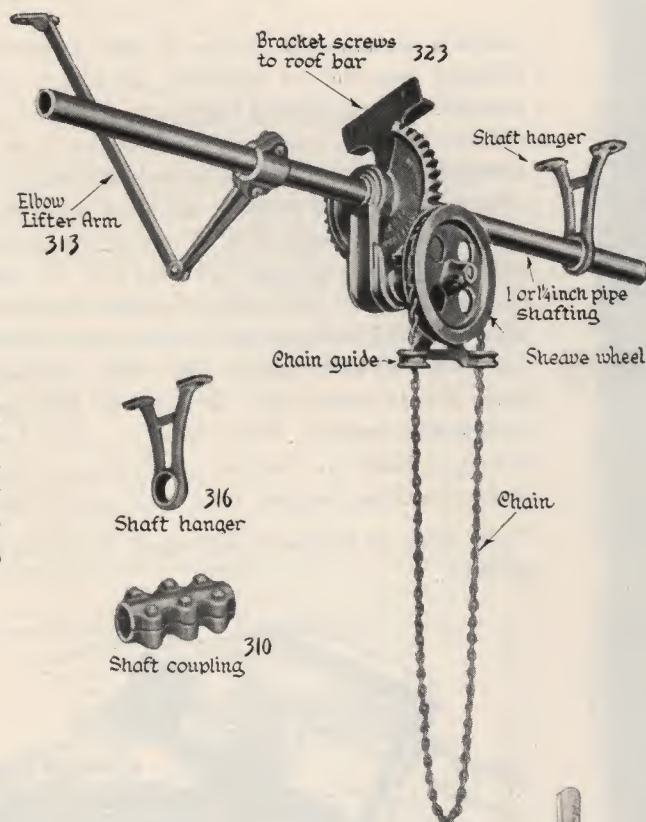
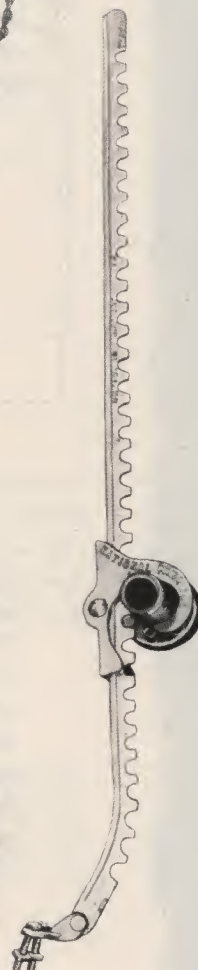
No. 324 Bike Chain for use on National Worm and Gear Roof Vent Machine.



No. 325 Jack Chain for use on Chain Pull Roof Vent Machine.



No. 326 Malleable Type Rack and Pinion Lifter Arm. For 1" shaft only. Complete with lifter arm lug and bolts.



## NO 321 NATIONAL WORM and GEAR VENT MACHINE

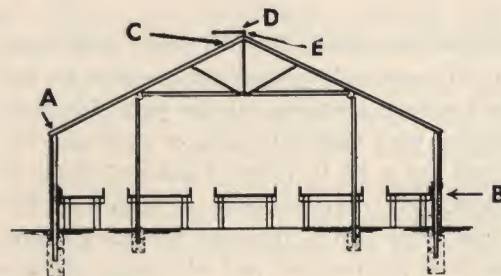
Cut steel worm and gear, operating in an enclosed grease case, make up the basic parts of this easy-operating, heavy duty roof vent machine. Special design of top bearing assures firm support for shafting without binding. Top sprocket will not slide. Large hand wheel furnished. One machine will operate up to 100 feet of sash in one run.



# NATIONAL STEEL PARTS...

National recommends the use of steel members when building new and for repairing old houses whenever possible. Galvanized steel will stand up better than wood and can be much smaller in size, too, due to its greater strength. Each steel item is completely fabricated and assembled as far as possible. Made up in six-light sections, for posts spaced 8'-4-1/8" on centers and for use with bars having tongues 5/8" wide and 1/2" deep, and spaced 16-11/16" on centers. Use steel wherever possible for quick erection and durable, neat construction. **IMPORTANT**—In writing your orders for steel parts keep this in mind. End sections are different from intermediate sections. Please specify one left hand and one right hand end section in addition to the intermediate sections required—for each run of material.\*

\*(See table in Section 7 for overall length of run required).



FOR EXAMPLE:

If ordering Steel Eave for both sides of a greenhouse 50'-3-14/16" long, having 36 lights of 16 inch wide glass—your order should read as follows:

STEEL EAVE—2 runs of 36 lights each

2-6 Light left hand end sections

2-6 Light right hand end sections

8-6 Light intermediate sections

Top Rails arranged for Fixed Glass, Post Top Fittings for 2" Pipe Posts

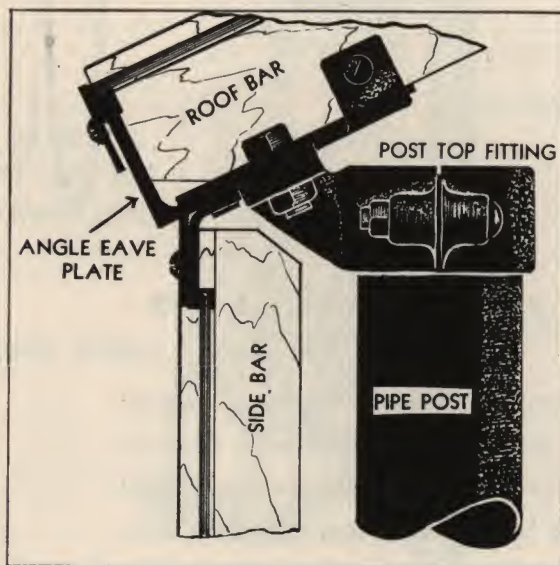


Illustration at Point A

## NO. 330 STEEL EAVE PLATE

In 8'-4" sections. The only steel eave that "lets the inside drip fall outside." Made of steel angle with a steel top rail riveted in place—entire eave is galvanized. Your choice of top rail arranged for fixed glass, for two-light sash, or for continuous ventilators. All hinge, drip and screw holes drilled. Complete with bar rests, zinc strips, glass stops, bolts, screws and post top fittings. Fittings for 1-1/2 or 2 inch pipe posts. Assembled in six light sections ready to bolt in place. We supply a post setting plan with each order. *When ordering, please specify size pipe post and how top rail is to be arranged.*

## No. 331 STEEL "T" SILL

In 8'-4" sections . . . galvanized, for use with angle eave plate or duplex steel gutter. Completely fabricated. Fittings supplied for 1-1/2 or 2 inch pipe posts. Complete with bolts, screws and zinc strips. We will furnish a post setting plan, showing how the posts are to be spaced. The finest steel sill money can buy. No rotting at this vital point when steel sill is used, no painting necessary, easily and quickly installed.

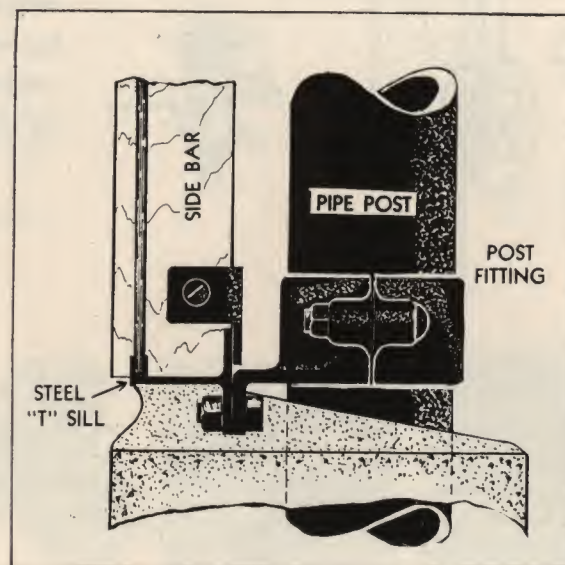


Illustration at Point B



# ... for Economy . . Longer Life!

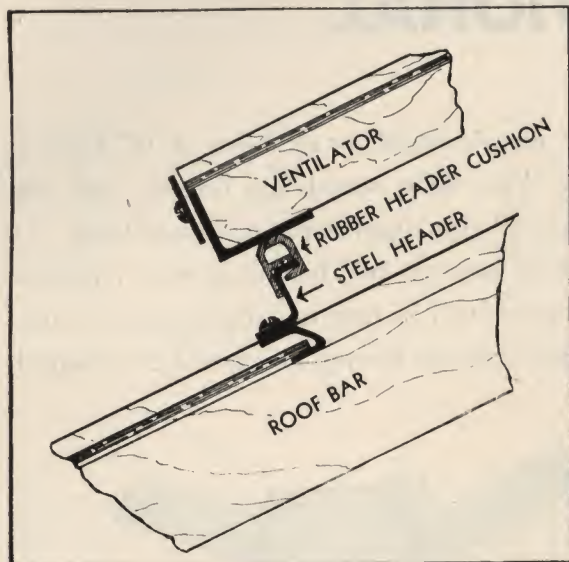


Illustration at Point C

## NO. 335 STEEL RIDGE CAP

In 8'4" sections, for use over wood ridge. We suggest this arrangement when double roof vents are desired at the ridge. Used with our No. 135 ridge. In six-light sections, fabricated for easy installation, including hinge holes for fastening continuous steel frame ventilators. In ordering cap for use over an old ridge, be sure that ridge extends above the roof bars high enough to allow for proper clearance of ventilators. If you wish, send us a small sample of your ridge and we will advise the best arrangement to use.

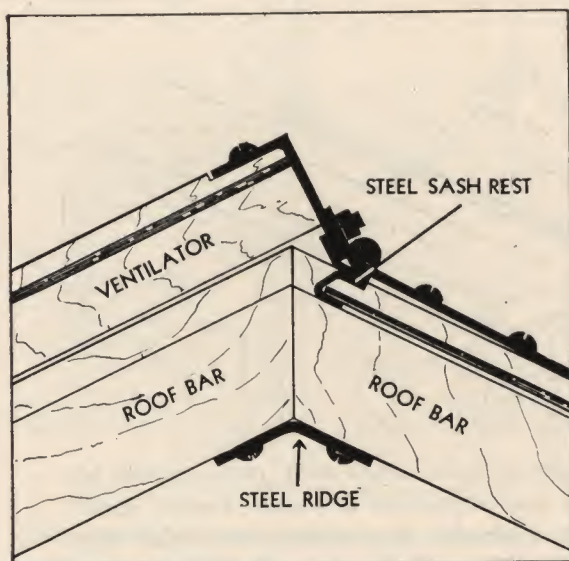


Illustration at Point E

## NO. 332 STEEL HEADER

In 8'4" sections . . . A formed steel header with steel glass retainers riveted on, all galvanized. Made for use over roof bars having  $\frac{5}{8}$ " wide tongues,  $\frac{1}{2}$ " deep and spaced 16-11/16" on centers (the correct spacing when 16" wide glass is used). Screw holes are drilled so that header can be fastened in place easily. Screws are furnished. (See Page 23 if rubber cushion is desired for use with header).

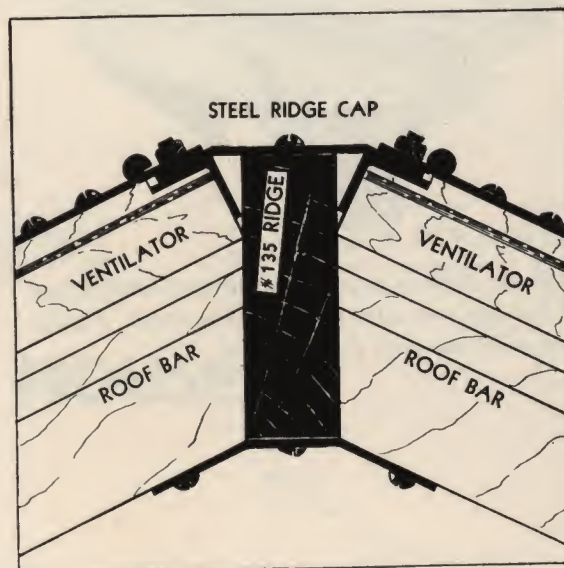


Illustration at Point D

## NO. 333 STEEL SASH REST

In 8'4" sections . . . galvanized. When Hookover Type Ventilator is used with our steel ridge a SASH REST IS NECESSARY. In 6-light sections for use on bars having  $\frac{5}{8}$ " wide tongues,  $\frac{1}{2}$ " deep and spaced 16-11/16" on centers. Glass retainers are riveted in place. Screws furnished.

## NO. 334 STEEL RIDGE

In 8'4" sections . . . galvanized. For bars spaced as above. Complete with bolts, screws and fittings for use with angle or rod ridge ties. Use this item only when ordering continuous steel framed vents with steel sash rest.



# No. 336 DUPLEX STEEL GUTTERS

## *The Finest By* NATIONAL

Now you can have the finest gutter ever made for greenhouse use. Arranged for six lights of 16" glass. A combination of beauty, strength and efficiency. National gutters have these outstanding features: safe, flat bottom for easy walking; huge, non-sweating sub-gutter catches all drip from sweat or minor leaks . . . allows you to plant directly beneath it; bars are fastened securely between two bottom gutters. Available in 8'4" sections for steel or pipe posts. Please specify whether gutter will be used on outside run or as connecting gutter between houses, the type and size post to be used and how the top rail should be arranged.

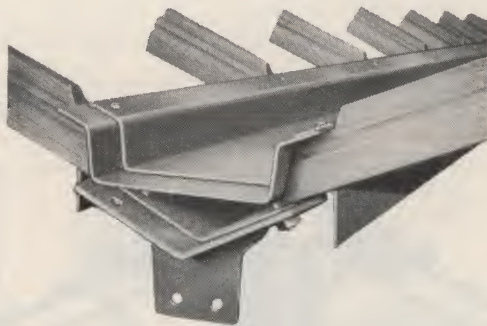
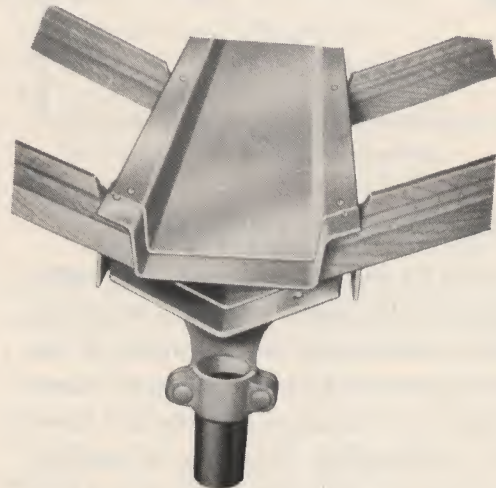
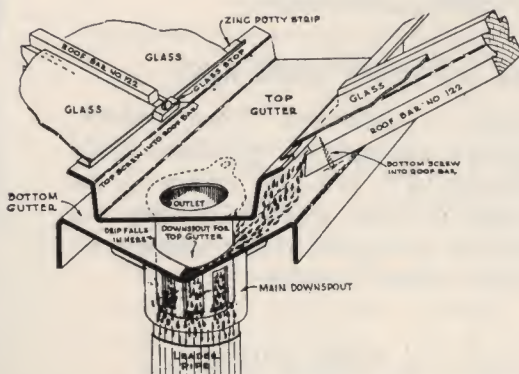


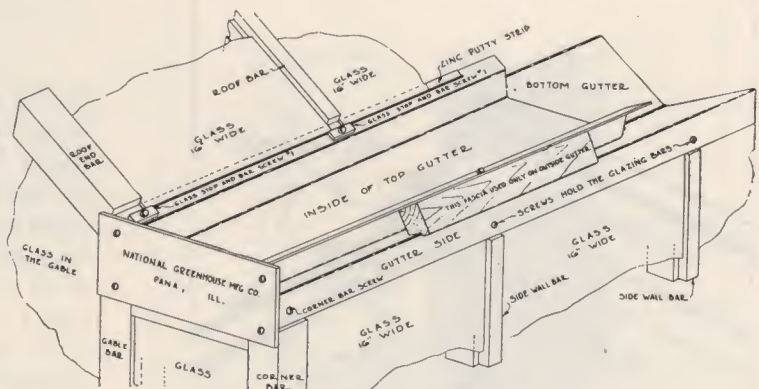
Illustration shows a gutter between two houses. Every roof bar has two screws for extra strength. Fitting shown is for use with flat steel post.



Gutter can be supplied with fittings for 1-1/2" or 2" pipe post. National gutters are sturdily constructed to give long, repair-free service.



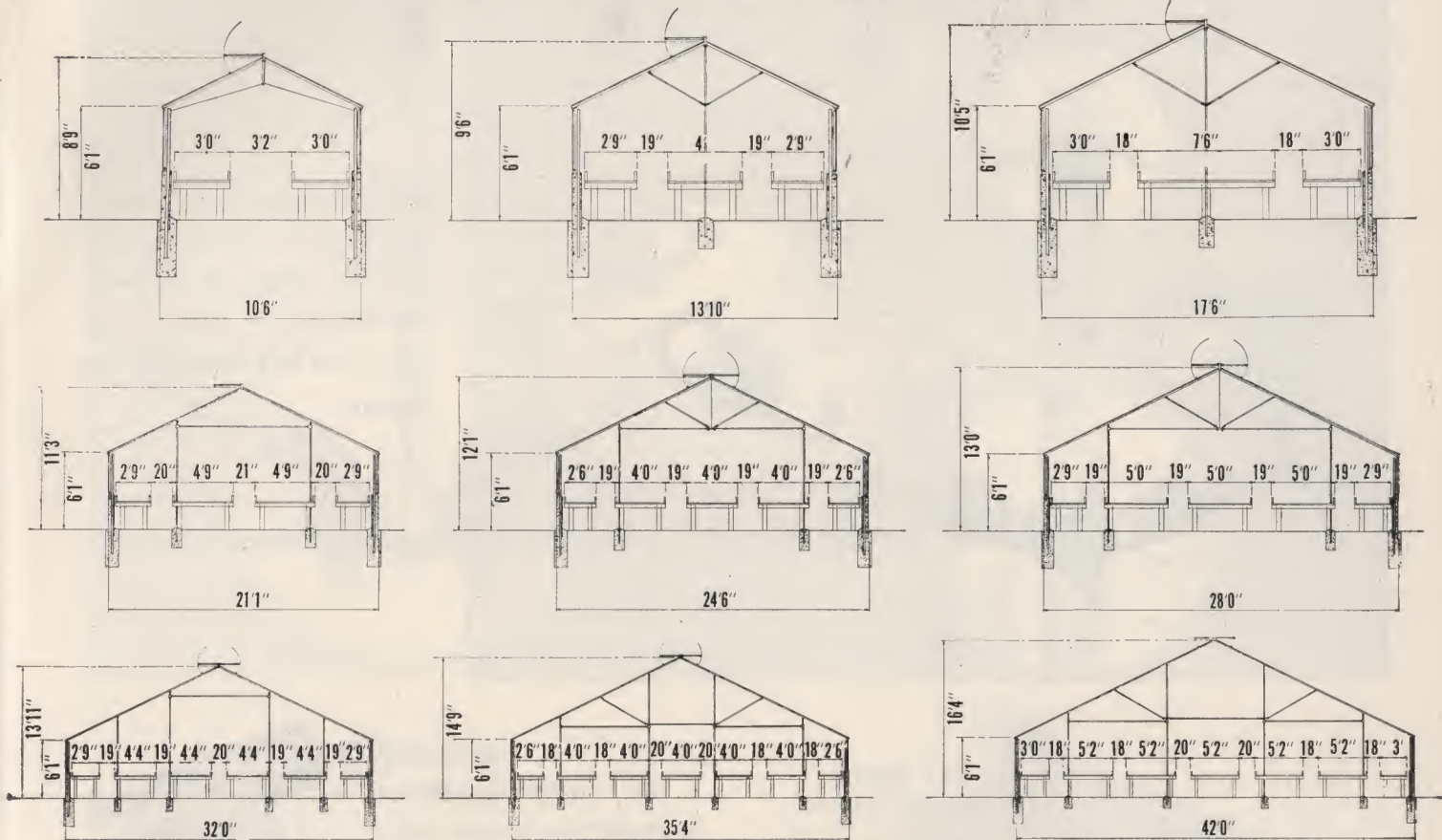
With National gutters one downspout does it all. The downspout castings are arranged to take the water out of both gutters at one time. If desired, gutter can be pitched and water drained out one end. If gutter is built on level, downspout fittings should be installed.



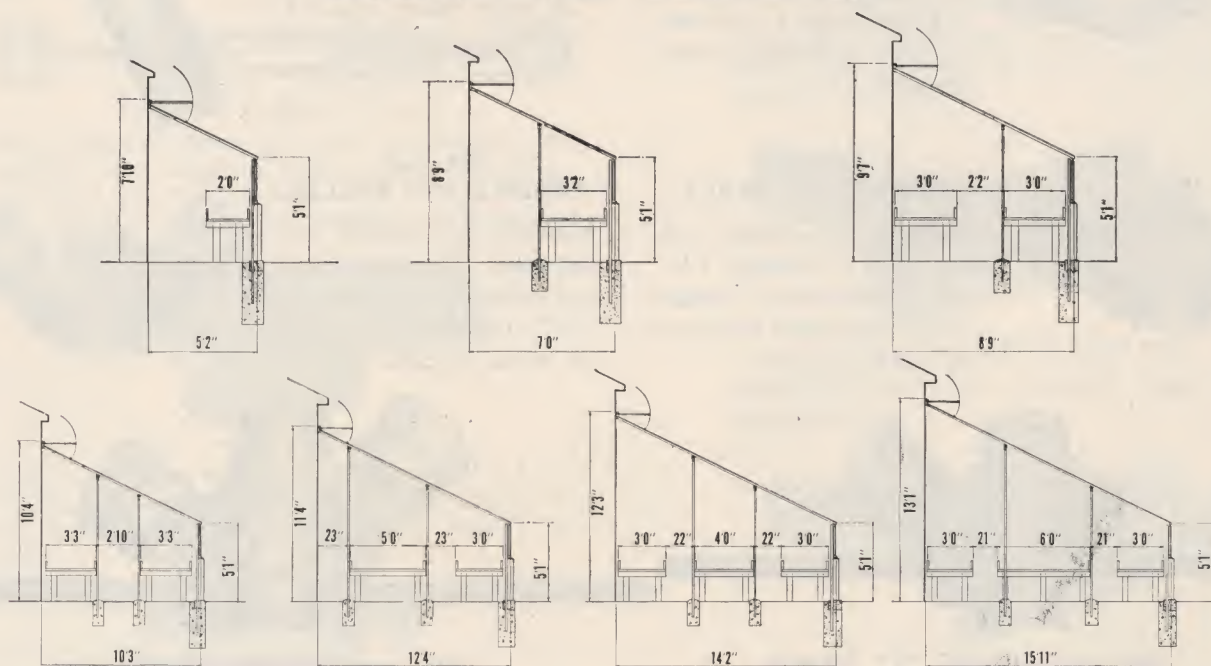
If the roof water must be carried away, gutters should be installed. For easy connection of future houses, install duplex gutters. Note glass stops which prevent glass slipping. Top rail of gutter can be arranged for fixed glass, two-light sash or continuous ventilators.



# Standard Models of PIPE FRAME HOUSES

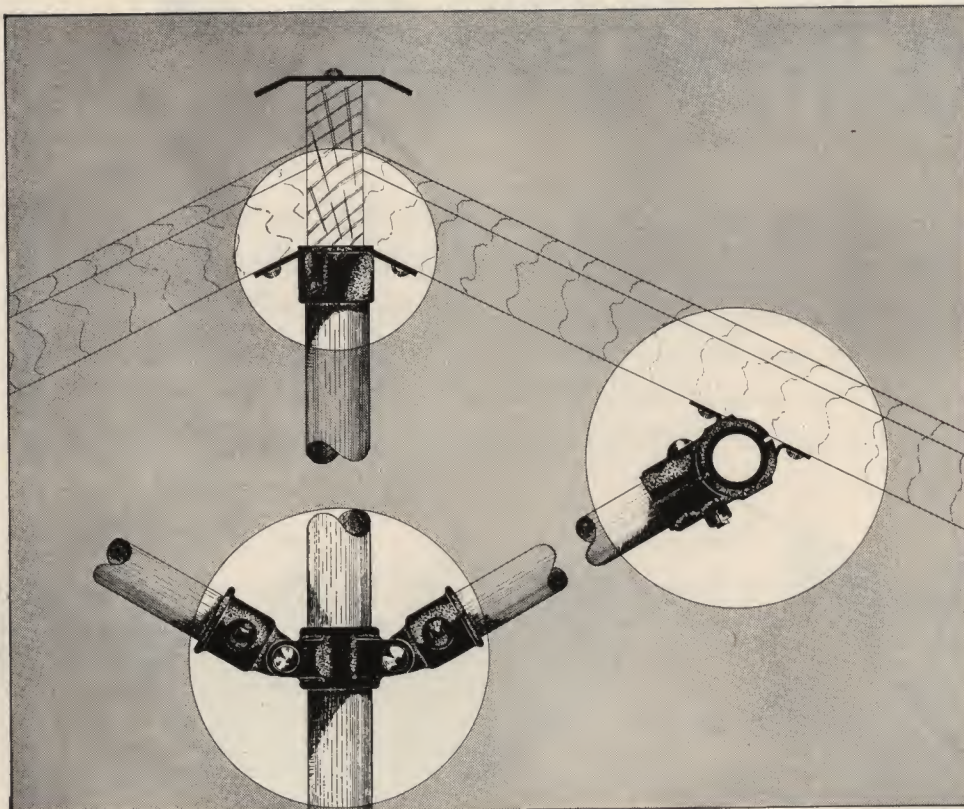


## LEAN-TO HOUSES



These drawings are designed to illustrate the size houses which can be built to best advantage with standard materials. They also indicate a suggested plan for interior bracing, bench arrangement, etc. See Section 7 for additional information on designing your own greenhouse, and the remainder of this section for the fittings and accessories required.





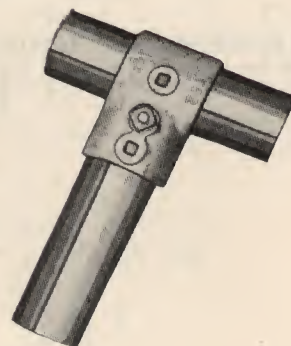
Quality fittings for pipe frame greenhouses are an added construction feature of *National Greenhouse Co.* You can be sure of the best when you buy National.

#### NO. 337 RIDGE COLUMN FITTINGS



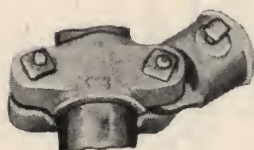
Malleable iron, painted. One piece set screw type. Also used for ends of pipe purlins in gables. Sizes 1, 1- $\frac{1}{4}$  and 1- $\frac{1}{2}$  inch. Galvanized screws furnished.

#### NO. 338 SPLIT TEE



Malleable iron, painted. Can be clamped on or bolted through the pipe. A variety of sizes from 1" x 1" x 1" through 1- $\frac{1}{2}$ " x 1- $\frac{1}{2}$ " x 1- $\frac{1}{2}$ ". Galvanized bolt furnished.

#### NO. 339 SINGLE "Y" BRACE



Malleable iron, painted. Collars from 1" through 1- $\frac{1}{2}$ " and sockets from  $\frac{3}{4}$ " through 1- $\frac{1}{2}$ ". Galvanized bolts and set screw included.

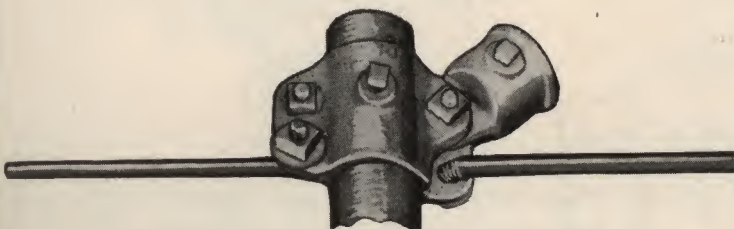
#### NO. 340 DOUBLE "Y" BRACES



Malleable iron, painted. Collars from 1" through 1- $\frac{1}{2}$ " and sockets from  $\frac{3}{4}$ " through 1- $\frac{1}{2}$ ". Galvanized bolts and set screws included.

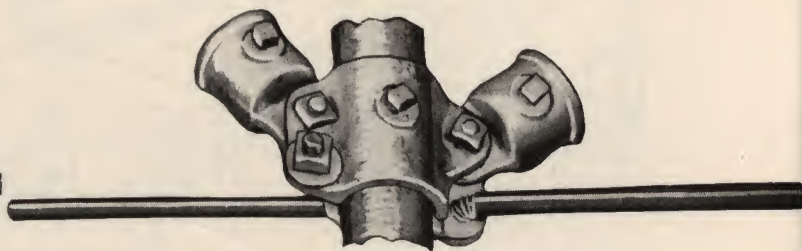
#### NO. 341 SINGLE "Y" BRACE

Malleable iron, painted. Extra heavy fitting for 1- $\frac{1}{4}$ " or 1- $\frac{1}{2}$ " upright with sockets from  $\frac{3}{4}$ " through 1- $\frac{1}{2}$ ". Fitting arranged to accommodate  $\frac{3}{8}$ " rod ties as illustrated. Galvanized bolts and set screws included.

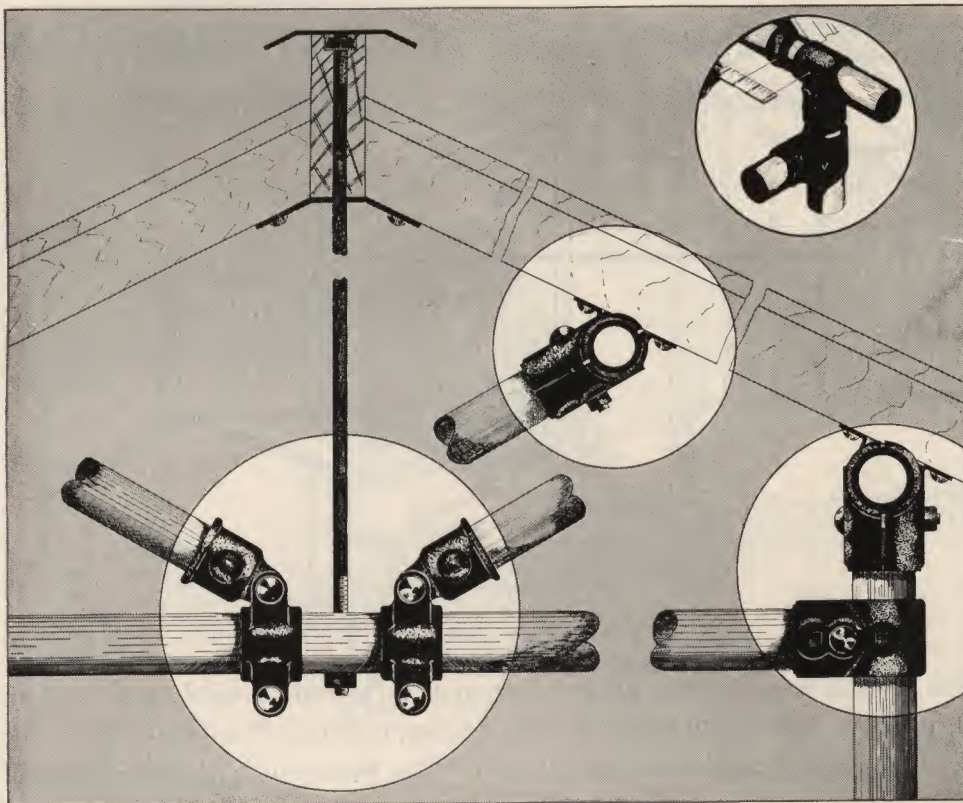


#### NO. 342 DOUBLE "Y" BRACES

Malleable iron, painted. Extra heavy fitting for 1- $\frac{1}{4}$ " or 1- $\frac{1}{2}$ " upright with sockets from  $\frac{3}{4}$ " through 1- $\frac{1}{2}$ ". Fitting arranged to accommodate  $\frac{3}{8}$ " rod ties as illustrated. Galvanized bolts and set screws included.







National pipe fittings are designed to do a better job economically. These fittings are easy to install, fit better and last longer.



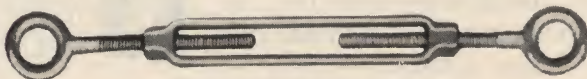
**NO. 343**  
**PURLIN END BEARERS**

Gray iron, painted. 1 or 1-1/4 inch. Screws included. Fastens to roof end bar and holds pipe roof purlin secure to the gable end of the greenhouse.



**NO. 347 THREADED ROD**

3/8" galvanized rod, available with threads on one or both ends. Washers and nuts furnished. Ends can be bent for use with "Y" braces as illustrated on page 18.



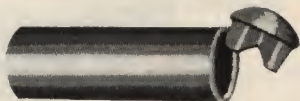
**NO. 348 TURNBUCKLES**

Drop forged, weldless galvanized turnbuckles are available in a variety of sizes to meet your needs. Furnished with eyes at both ends, or turn buckle body only for use with 3/8" threaded rod described.



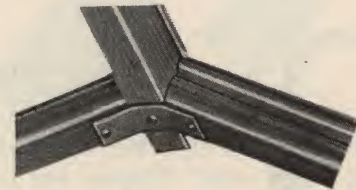
**NO. 349 BAR SPLICE**

Strong, 3-piece set for 1" or 1-1/4" pipe purlin. Used in splicing bars together over purlin. Set consists of top and bottom straps and pipe strap. Screws included.



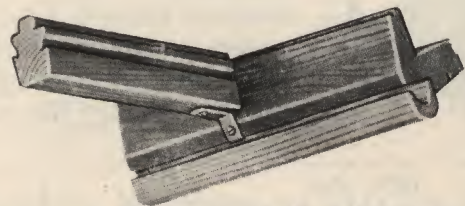
**NO. 350 PIPE END PLUGS**

Gray iron, painted. Made for 1" or 1-1/4" pipe. Closes ends of pipe purlin, pipe frame bench stringers, bench wiring frames, or vent shafting.



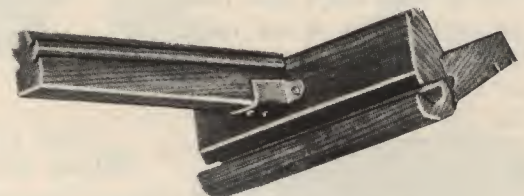
**NO. 344 RIDGE BAR TIE**

A strong galvanized steel tie of adequate length to assure positive holding of the roof bars to the ridge. Shipped with screws.



**NO. 345 EAVE BAR TIE**

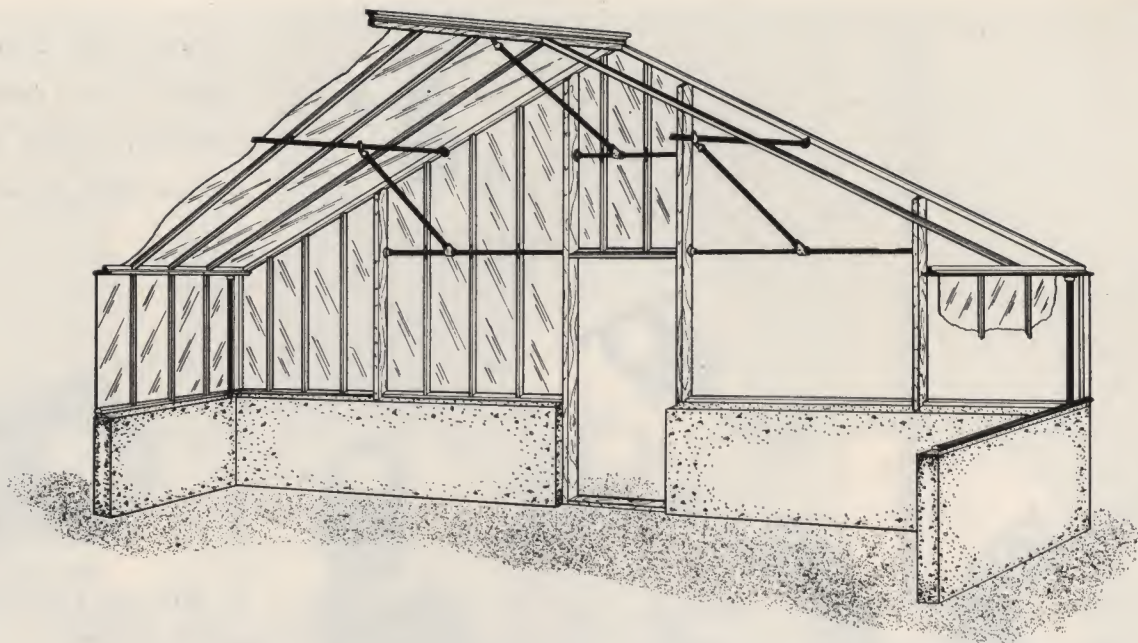
Galvanized steel. Screws included. Used on wood eaves or gutters.



**NO. 346 BAR SOCKET**

Galvanized steel. Screws included. For 1-3/8" wide roof bars and wood eave or wood gutter. A stronger support for the roof bar than the eave bar tie described above.



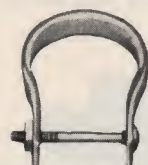


Most types of gables require some bracing to give them sufficient strength to withstand wind pressure. The width and height of house will, to some degree, determine the type bracing required. The illustration above is an example of good gable bracing. Fittings on this and the two preceding pages can be used to complete such an installation.



#### NO. 351 U-BOLTS

1-1/2 or 2 inch bolts, 4-1/2 and 5 inches long, respectively. Galvanized. Washers and nuts included.

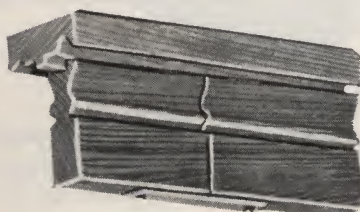


#### NO. 352 BLOCKING CLAMP

Galvanized. 2" only, 3-3/4" long. Used for fastening a 1-3/4" wide nailing strip to a 2" pipe post, to which wood sheathing can be nailed. Galvanized bolt included.

#### NO. 355 RIDGE GABLE BRACE

Malleable iron, painted. Made for 3/4, 1, 1-1/4 or 1-1/2 inch pipe. Used to fasten a pipe brace from the gable purlin to the ridge. Galvanized screws included.

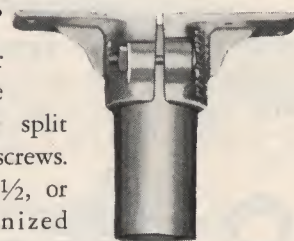


#### NO. 356 RIDGE SPLICE

Heavy, galvanized steel splice plate used to tie the ridge together at splice. Complete with galvanized screws.

#### NO. 353 POST TOP

For wood gutter or wood eave. Malleable iron, painted. 2-piece split type with bolts and screws. Available for 1-1/4, 1-1/2, or 2 inch pipe. Galvanized screw included.

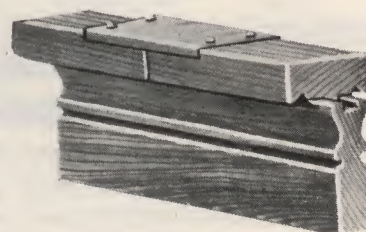


#### NO. 354 PIPE STRAPS

For purlins. Galvanized. Screws supplied. 3/4, 1, 1-1/4, 1-1/2 and 2 inch.

#### NO. 357 RIDGE CAP SPLICE

Heavy, galvanized steel splice plate used to keep water out of the splice and to tie the ridge cap together. Galvanized screws furnished.





# NATIONAL DOOR HARDWARE

Quality Where It Means The Most



## NO. 360 ORNAMENTAL DOOR CANOPY

Adds beauty to your greenhouse. Economical. Comes complete with painted steel brackets, and screws. Glass not included. Fits any make house. Easily installed.

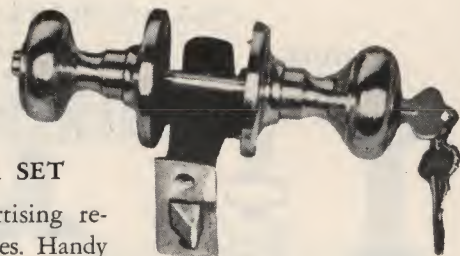


## NO. 363 ECONOMY THUMB LATCH

Hot galvanized. Built to take the wear and tear of greenhouse use. Convenient. Can be opened with your hands full. Latch has ring for your padlock.

## NO. 365 HOOKS & EYES

3" size. Heavy pattern. Cadmium plated. A variety of uses throughout the greenhouse.



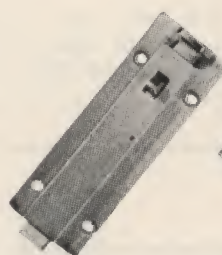
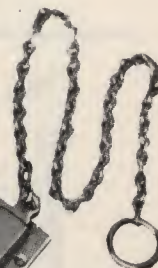
## NO. 361 CYLINDER LOCK SET

Polished brass. No mortising required, just drill the holes. Handy button latch. Complete with screws and two keys. For doors 1-1/4" through 1-3/4" in thickness. Locks can be furnished in pairs, keyed alike.



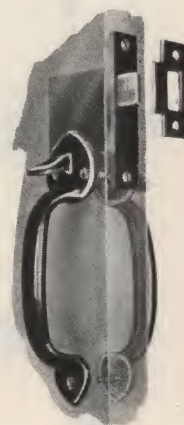
## NO. 364 CHAIN BOLT AND FOOT BOLT SET

Chain bolt is steel, brass-plated. 4" size with a 24" chain and ring for releasing latch. For double doors or filling sash. 4" brass-plated steel foot bolt has positive action lever for raising bolt. Screws included.

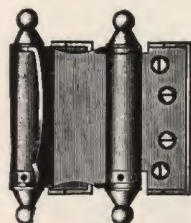


## NO. 362 MORTISE THUMB LATCH

Heavy duty galvanized mortised thumb latch with pulls and latch on both sides of door. For door 1-3/8" thick only. Shipped complete with screws.

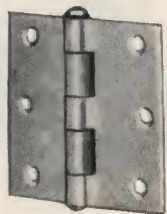


## No. 366 National Best Quality Hinges



### DOUBLE ACTING SPRING BUTT HINGE

4" for 1-3/8" thick x 2'6" wide doors. Black Japanned finish.



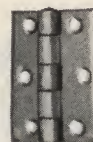
### DOOR HINGES

Galvanized. 3-1/2" x 3-1/2". Built to last a lifetime.



### SASH BUTT

Galvanized. 2-1/2" x 2-1/2". Used on wood vent sash.



### SASH BUTT

Galvanized. 2-1/2" x 2". Used on wood vent sash.



### "T" HINGES

For use with National steel sash. 2 bolts in one leaf, two screws in the other. Screws can be used in all holes for wood sash.

All National hinges are equipped with brass or stainless steel pins and are furnished complete with screws.



## NO. 370 BOLTS

STOVE  
BOLTS



ROUND  
HEAD



FLAT  
HEAD

MACHINE  
BOLTS

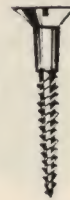


CARRIAGE  
BOLTS



All bolts galvanized or cadmium-plated. A variety of sizes are carried in stock for the types shown above. Refer to price list for a complete listing of sizes.

## NO. 371 HOT GALVANIZED WOOD SCREWS



Variety of sizes carried in stock for both round and flat head types. Refer to price list for a complete breakdown of sizes.

## NO. 372 HOT GALVANIZED NAILS



The best you can buy. A variety of sizes in finishing and common nails. See price list.

## NO. 373 WASHERS



Wrought steel. Variety of sizes for use with bolts described above, and for miscellaneous uses throughout the greenhouse. Black and galvanized available. Note price list.

# NATIONAL Suggests These Time-Savers!

## NO. 374 SPIRAL RATCHET SCREW DRIVER

Automatically drives or draws screws. Acts as a left or right hand ratchet or as a rigid screw driver. Return spring type which automatically returns handle for next stroke. Precision machined steel spiral, polished nickle, barrel and mahogany handle. 3 common size bits furnished.

## NO. 375 AUTOMATIC DRILL

Polished nickel case, with magazine type knurled handle. Points held securely in place with positive action, screw type chuck. Extra drill points available.

The two tools described above are extremely handy in greenhouse erection or repair work. We highly recommend their purchase as time and labor-saving devices.



## NO. 376 MARKING PEN KIT

A handy item to have around for marking crates, lumber, glass, etc. Specially designed for greenhouse use. Writes on anything! Kit includes pen, ink, and four felt tips.



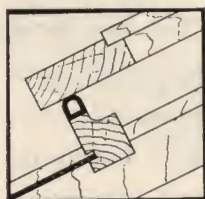
***The Finest in***

## **PARTS and ACCESSORIES**



### **NO. 377 RUBBER HEADER CUSHION**

For wood vent headers. Easily nailed to any wood header. For 3, 4, 5 or 6 light sash or continuous ventilators. All prices include weather strips for ends of sash, and nails.

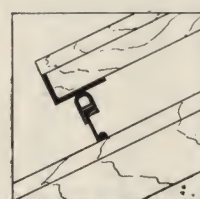
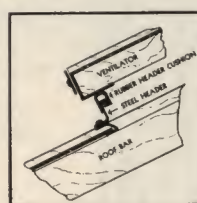


Rubber header cushion available in 10 ft. lengths for all wood headers. Splice together evenly to eliminate waste. Economical. Designed for long, trouble-free service.



### **NO. 378 RUBBER HEADER CUSHION**

For National steel vent headers. Slips easily over your header and stays in place. For continuous runs. Price includes weather strips for ends of sash.

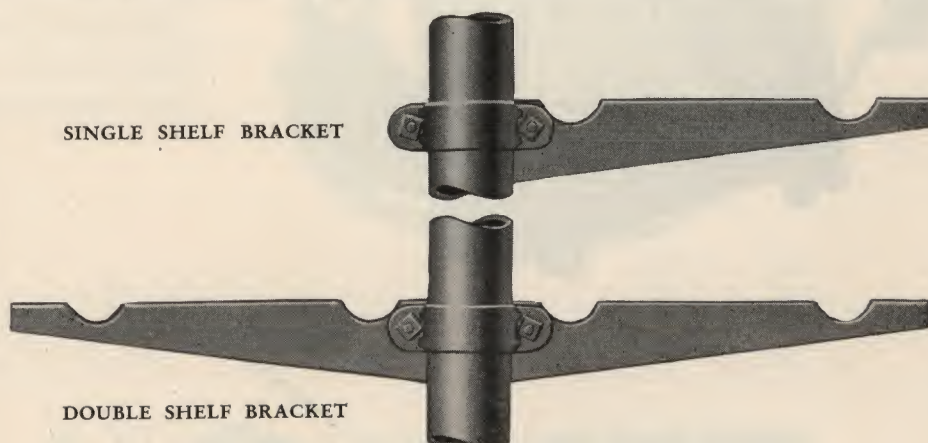


Exclusive National rubber header cushion stops vent leakage . . . seals your sash as tight as wax. No snow or rain drifting in. No big heat loss. Pays for itself in fuel saved.

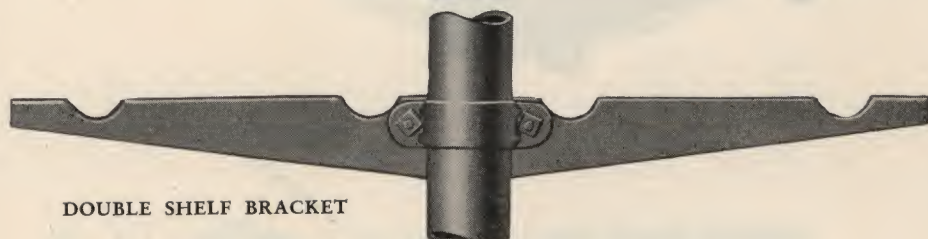
### **NO. 379 SHELF BRACKETS**

For use on upright pipe posts, 1" through 2". Single or double brackets available, complete with clamps, ready to bolt in place. Brackets are 8" or 12", recessed to accommodate two 1" or 1-1/4" pipe stringers. Helps you to utilize every available inch of growing space in your house.

**SINGLE SHELF BRACKET**



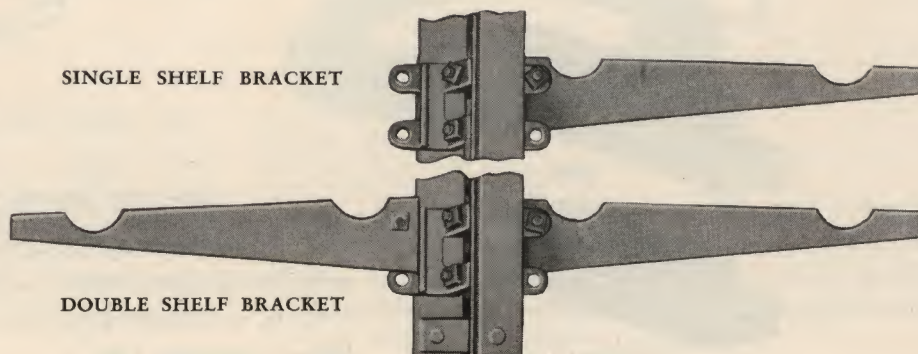
**DOUBLE SHELF BRACKET**



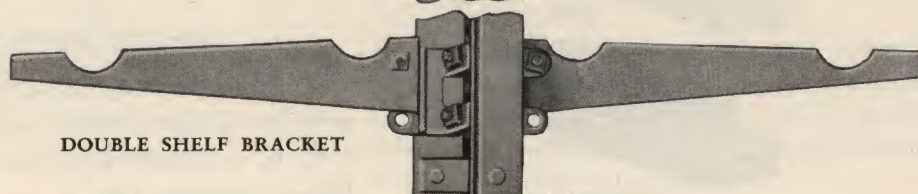
### **NO. 380 SHELF BRACKETS**

For use on National "star" angle posts. Single or double brackets available, 8" or 12" wide. Will accommodate two 1" or 1-1/4" pipe stringers. Come complete with clamps, ready to bolt in place.

**SINGLE SHELF BRACKET**

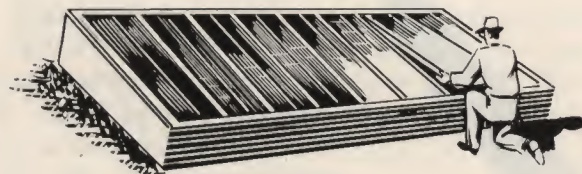
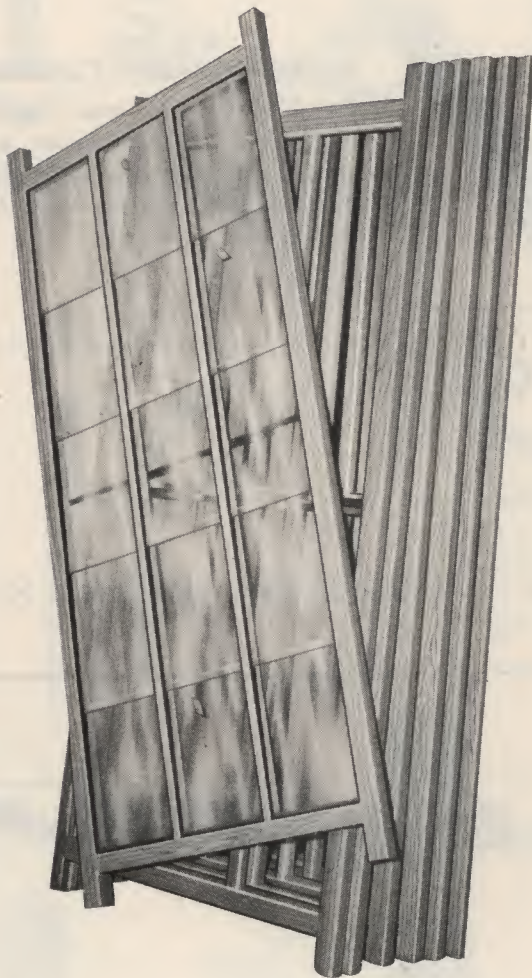


**DOUBLE SHELF BRACKET**



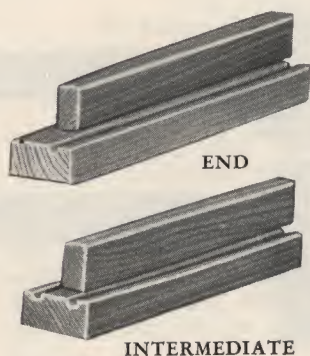
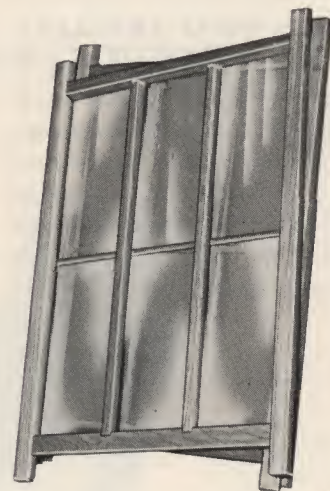


# No. 381 Genuine Cypress or Redwood **HOT BED SASH**



Made by hand, the old way, for people who know good sash. Hotbeds give you that extra space needed to start your vegetable plants each spring. Quality National sash is sturdily constructed of genuine Red Cypress or California Redwood. Strong, galvanized steel reinforcing bar keeps sash permanently square. 3' x 6' x 1 3/8" size holds 15 lights of 10" x 14" glass.

National hotbed sash is also available in the 3' x 4' x 1 3/8" size. Same fine construction as the larger sash. Built to last a lifetime. Genuine Red Cypress or California Redwood.



## NO. 150 HOTBED RAFTERS

End and intermediate. Sturdy construction of cypress or redwood. Each rafter is 2 3/8" wide, 2 1/2" deep and 4' or 6' in length. Grooved upper side to carry off leakage between sash.



# ELECTRIC HEATING EQUIPMENT

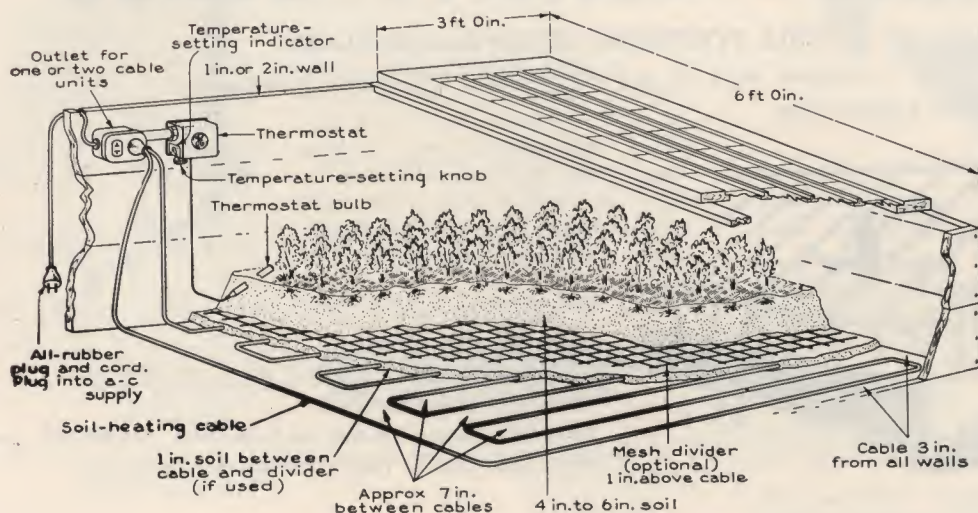


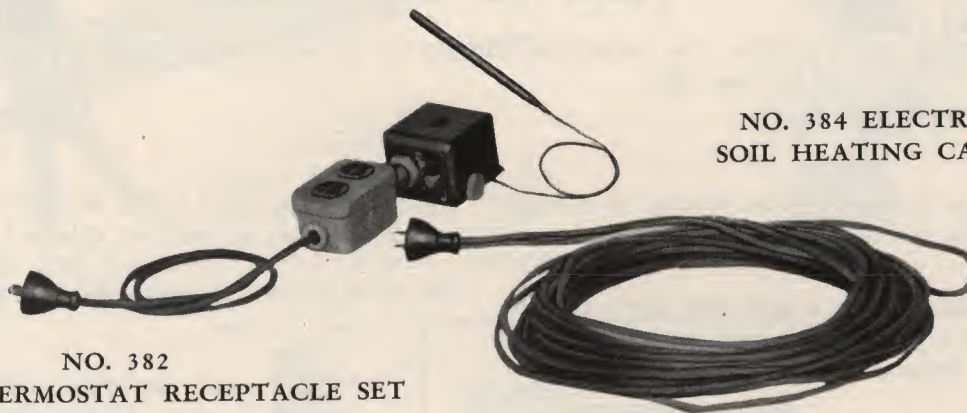
Illustration shows General Electric Soil Heating Cable in use in a hotbed. Due to the absolute uniformity of bottom heat, better plant growth results . . . easier and quicker than ever before. Thermostat guarantees economical operation.

## NO. 383 ECONOMY THERMOSTAT

Suitable for controlling one or two 60' (115 volt) lengths of electric soil heating cable. Ideal for small installations. Complete with 3' power supply cord and duplex receptacle.



## NO. 384 ELECTRIC SOIL HEATING CABLE



## NO. 382 DELUXE THERMOSTAT RECEPTACLE SET

Keeps heat at an even temperature to insure proper growth and money-saving operation. Temperature range 30° to 120° F. Six lengths of cable can be connected to same thermostat. Mount thermostat in any convenient location. Bulb is placed in the soil to maintain proper temperature for better growth. 3 ft. power supply cord with male plug is furnished.

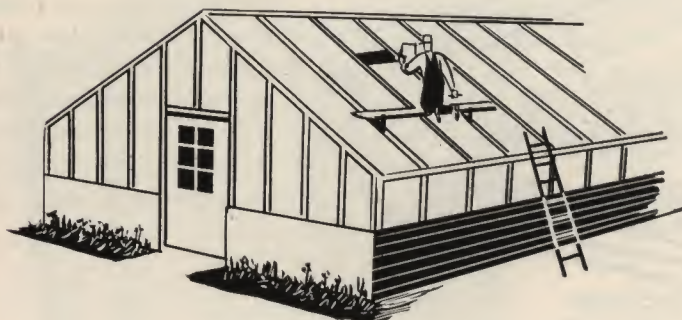
115 volt cable can be furnished in 60' lengths to heat 36 sq. ft. of bed. 230 volt cable available in 120' lengths will heat 72 sq. ft. Either type cable furnished with male plug for connection with thermostatic controls. The finest, heavy-duty, lead-sheathed cable on the market.



# The Show Window of YOUR Greenhouse! NATIONAL'S *QUALITY* GLASS

## NO. 385 DOUBLE STRENGTH GREENHOUSE GLASS

National carries a complete stock of full double-thick, top quality greenhouse glass in all the popular sizes.

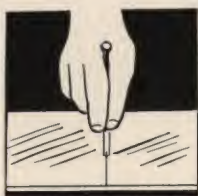


|           |           |           |           |
|-----------|-----------|-----------|-----------|
| 8" x 10"  | 10" x 12" | 10" x 14" | 14" x 16" |
| 14" x 18" | 14" x 20" | 16" x 16" | 16" x 18" |
| 16" x 20" | 16" x 24" | 16" x 30" | 16" x 36" |
| 18" x 20" | 20" x 20" | 20" x 24" |           |

Fine, clear glass—smooth on both sides. No blisters that burn your plants. Packed 50 sq. ft. to the box.

## NO. 386 CRYSTAL SHEET GLASS

Adds beauty to your greenhouse. Show window panels 3/16" thick available in 3 sizes. 4' x 3', 4' x 4', 4' x 5'. Priced in lots of six lights or more. Greenhouse shown at right makes attractive use of 4' x 3' lights.



## How To Cut Glass

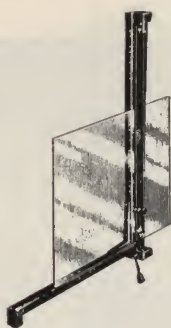
Follow these instructions carefully for the easy, efficient way to cut your glass.



- 1) Clean glass thoroughly before starting. Be sure that glass is flat and level on table.
- 2) Dip cutter wheel in a light body motor oil (not turpentine). A mixture of one part motor oil and one part kerosene is ideal.
- 3) Place cutter between first and second fingers, thumb on underside of handle (see illustrations).
- 4) Start wheel on far side of glass (1/8" from far edge). Hold cutter erect so that wheel will revolve easily, make a straight, even stroke.
- 5) Press just hard enough to make fine hair line. Press too hard and glass will flake or burn.
- 6) Run cutter wheel entirely across glass, allowing it to drop off pane.
- 7) For best results, use straight edge, allowing for 1/2 width of cutter head when measuring.
- 8) To break glass hold pane firmly between thumb and index finger with both hands. Give glass a slight bend and it will break or "run" the entire length of the cut. For narrow strips use breaker in head of cutter.



# NATIONAL *Makes Glazing an Easy Task!*



**NO. 387  
VERTICAL GLASS BOARD**

The sure, easy way to cut your glass. Designed for accuracy . . . no guess work. All metal construction. 36" x 42" capacity. Will cut strips, as well as lites, from 5/16" to 42". Carbide wheel glass cutter free with each board. An economical investment where a large amount of glass cutting is done.

**NO. 394  
ECONOMY  
SCRAPER**



Handy single blade scraper. Exceptional value at a very low price.

**NO. 393 JAK-NIFE  
SCRAPER**

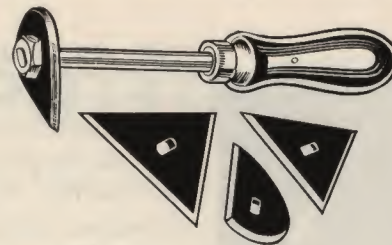


Safety knife. Holds single or double edge razor blade. A tool of a hundred uses.

**NO. 389  
GLASS CUTTER**



Gives you the latest in glass cutting smoothness and economy. Length 5". Standard design easy finger rest handle, long-reaching head.



**NO. 388  
BAR SCRAPER SET**

Steel scraper shaft is 9" overall length with wood handle. 4 blades, as illustrated, including 2 triangle blades. Ideal for cleaning roof bars.

**NO. 390  
GLASS PLIERS**



Popular-priced, rugged strength. Nicely balanced with flared grip jaw—preferred by many glaziers.

**NO. 392  
PUTTY KNIFE**



Economical, high-quality knife. 1-1/2" wide stiff blade, one-piece tenite handle.

**NO. 391  
PUTTY KNIFE**



Best quality 1-1/2" putty knife. Stiff blade. Finest design and materials.



**NO. 395  
GLAZING GUN**

Heavy, all-steel construction, with rust-proof finish. Trigger type gun, adaptable for bulk or cartridge putty use. Parts included for both. One pint capacity. Furnished with 3/8" and 1/4" round tips.

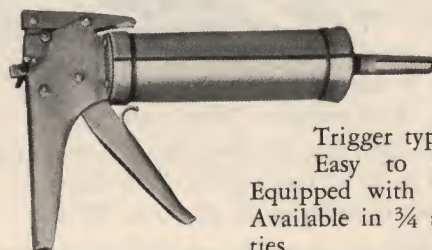


**NO. 396  
PUTTY CARTRIDGE**

Best quality asbestos gun putty in 8 1/2" cartridge (2" diameter). Will fit most cartridge guns. A time and mess saver. Your choice of gray or white.



**NO. 397 GLAZING GUN**



Trigger type bulk putty gun. Easy to fill and operate. Equipped with 3/8" round nozzle. Available in 3/4 and 1 pint capacities.

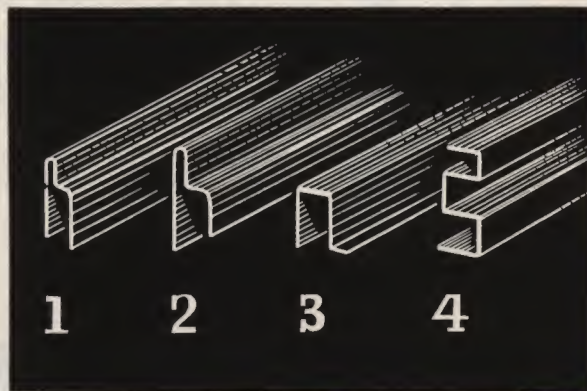


# Buy NATIONAL For Your Glazing Needs!



## NO. 400 STEEL POINTS

Choice of the top glaziers. Our famous round galvanized steel glazing points. Designed for quality work. Won't freeze out.  $\frac{3}{4}$ " long. No. 16 gauge. Packed in one pound packages.



## NO. 403 GLAZING ZINCS For 16" Glass

- 1) Used on our steel vent sash.
- 2) For V-type steel gutters and far superior to the old Z-shaped zincs.
- 3) For National duplex steel gutter.
- 4) Used with old style National channel steel sash header.

## NO. 401 ZINC POINTS

Solid zinc, wedge-shaped.  $\frac{5}{8}$ ",  $\frac{3}{4}$ " or  $\frac{7}{8}$ " length. Packed in one pound packages.



## NO. 402 GLAZING STAPLES

Zinc coated steel. Strong and heavy. No. 2  $\frac{1}{2}$  size. 1000 staples in each box. The proper size for double-strength glass.



## NO. 404 PAINTER'S BRACKET

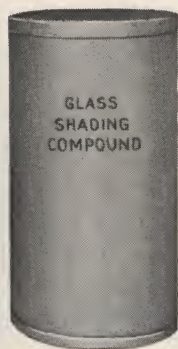
A handy roof repair aid. Hooks over two  $1\frac{1}{4}$ " No. 10 screws. Bracket and screws are galvanized. Space about 32" apart up and down roof—every 4th bar. Screws can be left in roof for next repair job. 2 screws furnished with each bracket. Additional screws available.



## NO. 405 GLAZING CHISEL

Specially designed for driving glazing points in greenhouse work. Preferred by professional glaziers everywhere.

## NO. 406 GLASS SHADING



Stops burns—saves your plants. Powder form. Mix with water and brush or spray on glass in thickness desired. Rain-resistant. Won't rot putty. Easily removed. 25 lbs. should cover 1,000 sq. ft. of roof surface. Your choice of green or white in 10, 25, 50 or 100 lb. quantities.



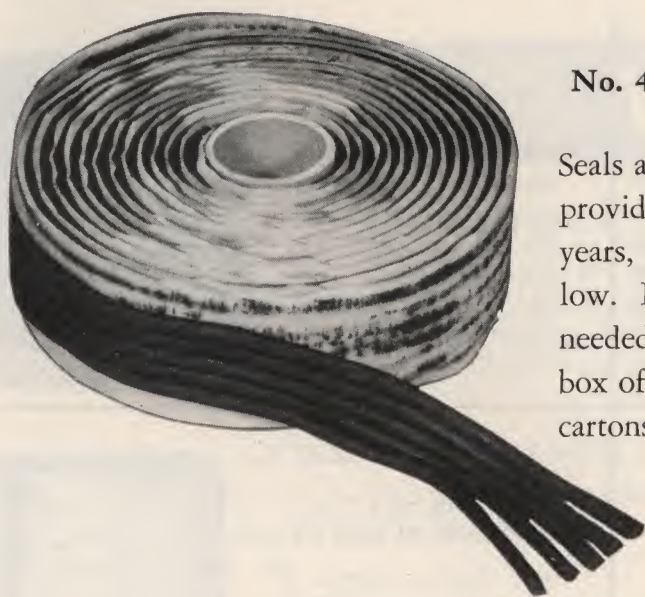
## NO. 407 GLASS CLEANER CRYSTALS

Garland LITE-NING cleaner crystals. For average use mix  $\frac{1}{2}$  pound of crystals to a gallon of water to clean 350 sq. ft. of glass surface in your greenhouse. Apply with brush and rinse off with water. Not injurious to paint or putty. Available in 5, 10, 25, 50 and 100 pound bags.





# NATIONAL'S *Exclusive* GLAZING MATERIAL



No. 408

## PUTTIROPE

Seals all leaks on glass, wood or metal. Easy to apply, providing surface is clean. Stays soft and pliable for years, yet won't run at 200° or get brittle at 30° below. Roller included for easy application. 75 ft. needed for each box of 16" x 18" glass; 76 ft. for box of 16" x 24" glass. Available in 100 and 500 ft. cartons.



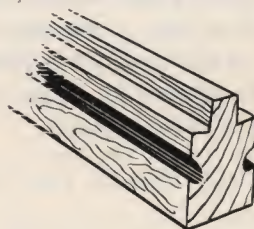
No. 409

## PUTTITAPE

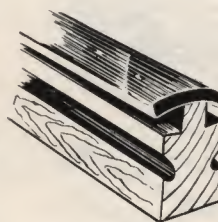
The ideal glazing material for stopping greenhouse leaks. Features similar to Puttirope, except putty is in tape form with aluminum foil covering. Completely covers tongue of roof bar. Virtually eliminates outside painting and greatly reduces repair costs. Roller supplied for easy application on clean surface. 1½" wide tape available in 125 ft. cartons for use on bars with 5/8" or 11/16" wide tongues. 1¾" width available in 150 ft. cartons for use on bars with ¾" or 7/8" wide tongues.

### NO. 410 BAR CAP TAPE

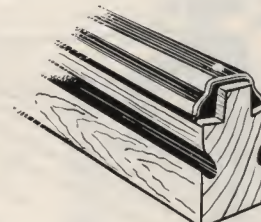
National's new bar cap tape is designed specifically to replace bulk type putties normally used under metal bar caps. Merely place a strip of the proper length in bar cap and set over tongue of the roof bar—fastening it in place with screws. The non-hardening and non-shrinking qualities of this compound insures long, leak-proof service. Proper width for use on bars with 5/8" or 11/16" wide tongues. 125 ft. to each box.



BAR



BAR CAP TAPE



METAL BAR CAP



# PUTTY *For Every Greenhouse Need*

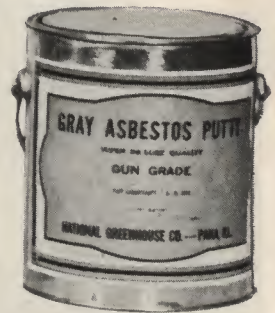


## NO. 411 ELASTIC GLAZING COMPOUND

Highest quality knife grade putty available. Ideal for new or old glazing work. Available in 25, 50 and 100 lb. cans. Figure 4½ lbs. of putty for each box of glass.

## NO. 412 ASBESTOS GUN PUTTY

Put an end to glass leaks with this top-grade putty. Stays soft, yet sticks tight, always. One gallon will do approximately 200-250 sq. ft. of roof surface. Available in gray or white, one or five gallon cans.

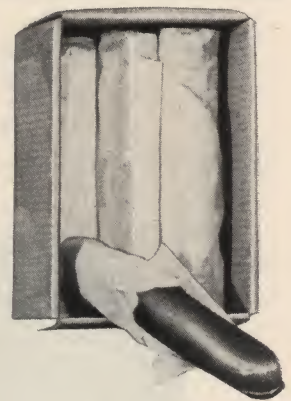


## NO. 413 GREENHOUSE BEDDING PUTTY

Fine grade putty made with pure linseed oil and best grade whitening. Use 4½ lbs. putty for each box of glass. Available in 12½, 25, 50 and 100 lb. cans.

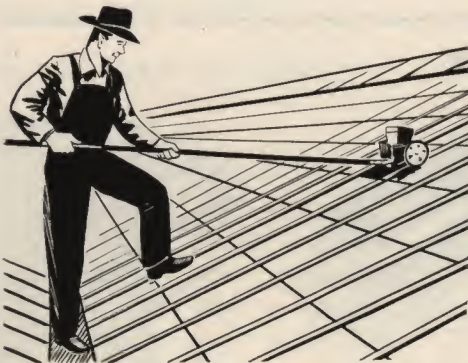
## NO. 414 PERMAGUM PUTTY

Same quality material as used in Puttirope and Puttirate. Permanent, non-hardening. Makes a perfect glazing job. Knife grade, available in black. 25 lb. cartons.

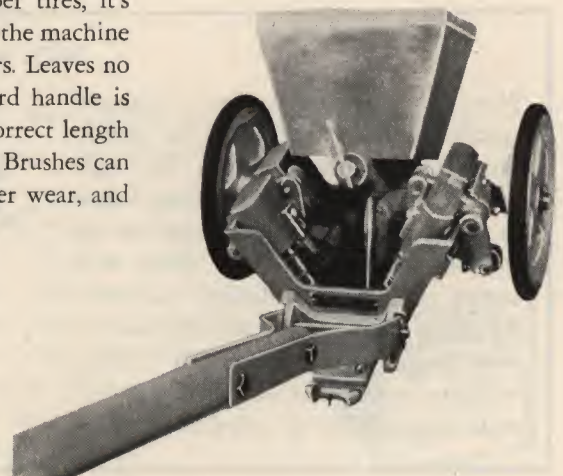


## No. 415 *Thompson* BAR PAINTER

The fast and easy answer to painting the tongues of your roof bars and sealing roof leaks. Of fine, lightweight construction, this painter is designed to daub the paint in those cracks, just like you would do with a paint brush, and smooth it down, all in one operation.



Equipped with rubber tires, it's an easy task to move the machine up and down the bars. Leaves no guide tracks. Standard handle is 11 ft. long . . . the correct length for bars up to 16 ft. Brushes can be adjusted for longer wear, and are easily replaced.





# NATIONAL'S *Quality Paints*



**READY  
MIXED**

**WHITE PAINT**

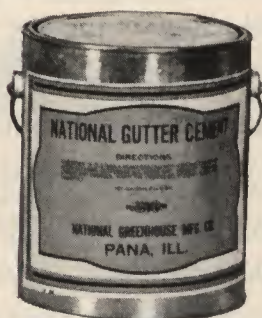
## NO. 416 TITANIUM OXIDE PAINT

Snow white. Stays white longer, reflects more light. Resists fumigating, will not crack or peel off. Chemically treated to resist mildew and other fungi. Economical, durable—covers a lot of space. Available in one and five gallon cans.



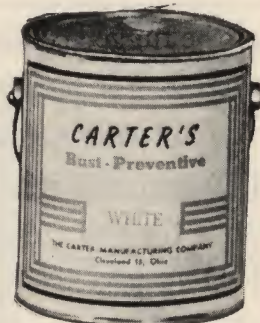
## NO. 417 SEMI-PASTE TITANIUM OXIDE PAINT

Same as above except in paste form. One gallon plus linseed oil and turpentine makes 2 gallons of paint. Just the thing for those big jobs—a real money saver, too. Comes in one and five gallon cans.



## NO. 418 NATIONAL GUTTER CEMENT

Perfect for leaky wood gutters. One gallon will do 75 ft. of gutter. One and five gallon cans.



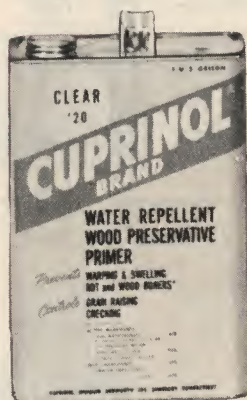
## NO. 419 CARTER'S RUST PREVENTIVE PAINT

Preserves, protects, beautifies. High elasticity, excellent for all metal or wood surfaces. Available in a variety of colors in one and five gallon cans.



## NO. 420 METALKOTE

Protects all metal. Use it anywhere. Helps you keep your house clean. A real economy buy. Black, in one or five gallon cans.



## NO. 421 CUPRINOL

Liquid wood preservative. Can be applied with brush, spray or by dipping. Will not harm plants, once dry. Green or clear available in one and five gallon cans. Clear Cuprinol can be used as a paint base.

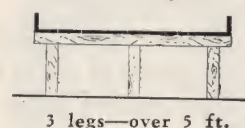
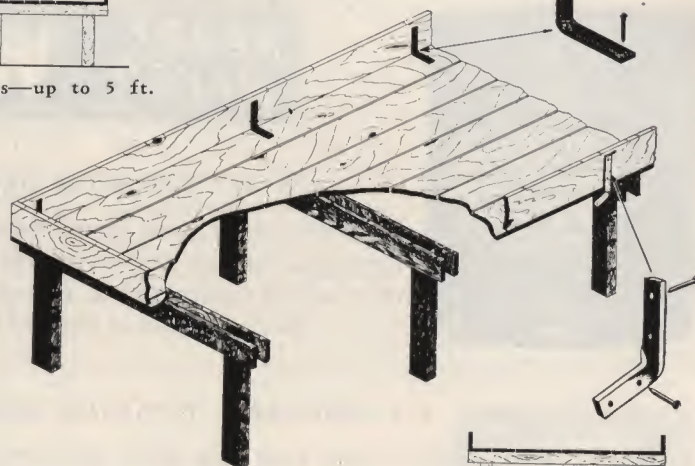
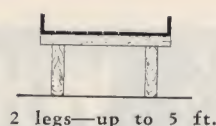
## NO. 422 ALUMINUM PAINT

An outstanding chemical research product. Deeply penetrates the wood—a test-proved preservative. Well suited for metal use. Mixed, ready to apply. Available in one or five gallon cans.





# COMMERCIAL TYPE BENCHES

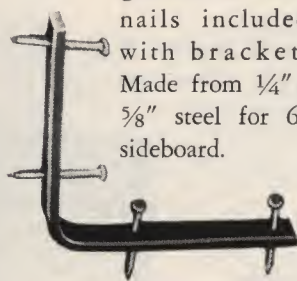


## NO. 423 BENCH LUMBER

The above sketch is indicative of the rugged construction of commercial type benches, the most popular for greenhouse use. For best results, National suggests the use of either Tidewater Red Cypress or California Redwood. Size of bottom boards depends upon width of bench desired. When soil is to be used in benches, space bottom boards about  $\frac{1}{2}$ " apart. Legs ( $2 \times 4$ ") and crosspieces ( $1 \times 4$ ") should be spaced 3 to  $3\frac{1}{2}$  ft. apart, lengthwise of the bench. Sideboard brackets can be either twisted or angle type. The following lumber sizes are available in stock at all times:  $1 \times 4$ ",  $1 \times 6$ ",  $1 \times 8$ ",  $1 \times 10$ ",  $1 \times 12$ ",  $2 \times 4$ ". Order the bench materials you need today.

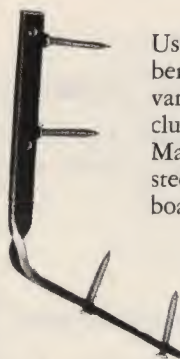
### NO. 424 ANGLE BENCH BRACKET

Used on inside of bench. Your choice of either black or galvanized. Boat nails included with bracket. Made from  $\frac{1}{4}$ " x  $\frac{5}{8}$ " steel for 6" sideboard.



### NO. 425 TWISTED BENCH BRACKET

Used on outside of bench. Black or galvanized. Nails included with bracket. Made from  $\frac{1}{4}$ " x  $\frac{5}{8}$ " steel for 6" sideboard.



### NO. 426 BOAT NAILS

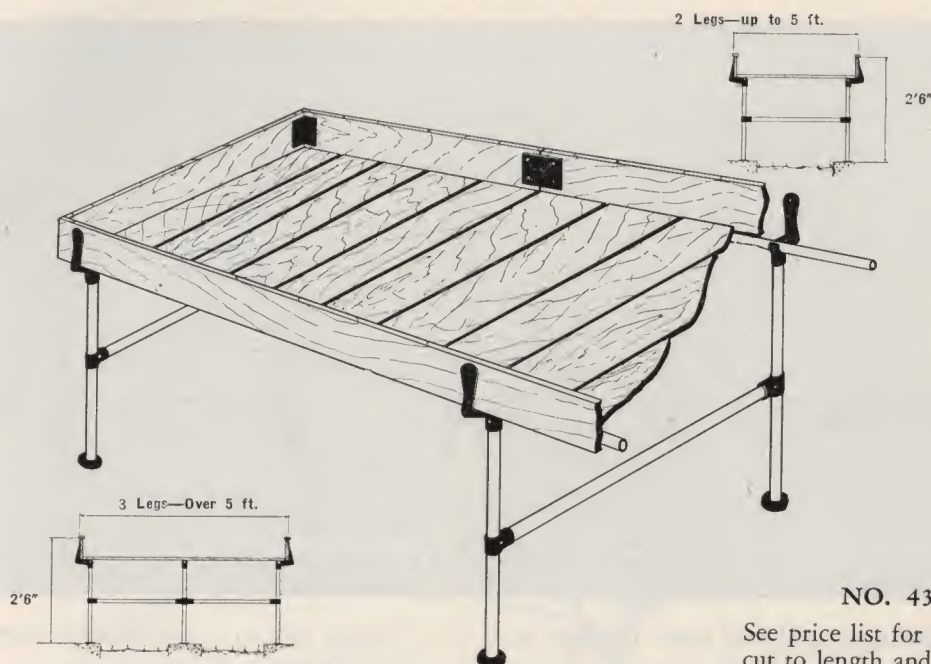
Heavy spike nails with big, round heads. Black or galvanized. Only  $1\frac{1}{2}$ " long. Will clinch securely in wood. (Galvanized 8 penny common nails also available for use with redwood lumber. See Page 22.)



NOTE: WHEN BUILDING BENCHES WITH REDWOOD, GALVANIZED BRACKETS AND NAILS SHOULD BE USED.



# PIPE FRAME BENCHES



If your greenhouse will be used as a show house, for hobby purposes, or anyplace where an extremely neat appearance is desired, National recommends the use of pipe frame benches. Surfaced sideboards can be obtained to give a more finished job. Bottom boards can be cut to proper length, or you may purchase cypress or redwood lumber in random lengths and cut the boards to fit yourself. 1x6" lumber is generally used for side and bottom boards.

NOTE: SEE PAGE 19 FOR ORDERING PIPE END PLUGS.

## NO. 438 BENCH LUMBER

See price list for pipe frame bench bottom boards cut to length and for surfaced side boards.

## NO. 174 BENCH MOLDING



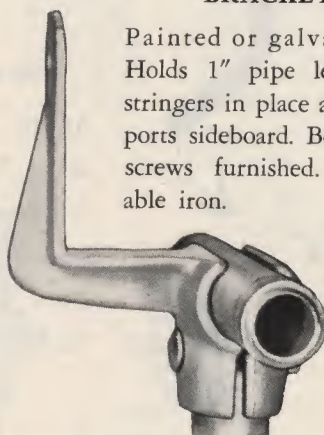
$\frac{3}{4}$ " x  $1\frac{3}{4}$ ". Used to cap the sideboards in order to give the bench a neat appearance. Cypress or redwood.

## NO. 431 BENCH CORNER BRACE



Galvanized angle iron. For 6" sideboard. Used on inside of bench. Galvanized screws included.

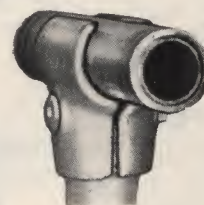
## NO. 427 SIDEBOARD BRACKET



Painted or galvanized. Holds 1" pipe legs and stringers in place and supports sideboard. Bolts and screws furnished. Malleable iron.

## NO. 428 SPLIT TEE

Used on benches over 5 ft. in width. Holds 1" center pipe leg and stringer. Bolts included. Galvanized or painted, malleable iron.



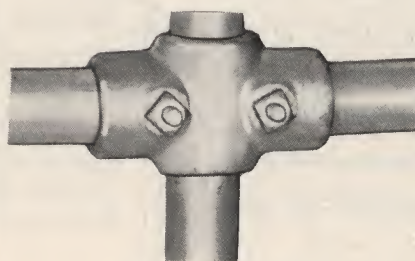
## NO. 432 SIDEBOARD SPLICE PLATE



Heavy, flat aluminum plate. Used on inside of sideboard at splice. Galvanized screws included.

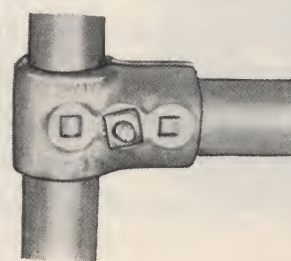
## NO. 429 SPLIT CROSS

Used to connect 1" cross brace and 1" center pipe leg. Painted or galvanized. Bolts included. Malleable iron.



## NO. 338 SPLIT TEE

Order two for each 1" cross brace. Your choice of painted or galvanized. Malleable iron. Furnished complete with bolts.



## NO. 430 BENCH LEG BASE



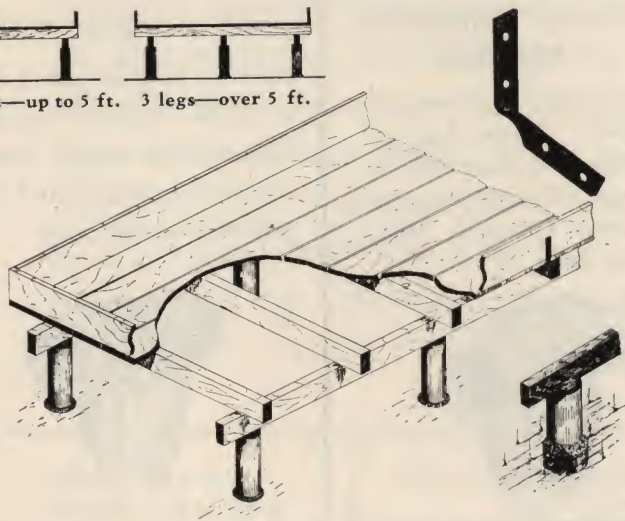
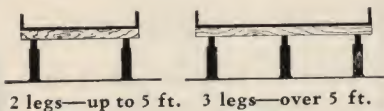
Malleable iron, painted or galvanized. For 1" pipe.



# GROUND BEDS and STAKES



Use 1 x 8", 1 x 10" or 1 x 12" sideboards, holding them in place with 2 x 4" stakes spaced approximately three feet apart. Order No. 433 Ground Bed Stakes 2x4"x2'6", pre-sharpened. See page 32 for sideboard bench lumber.

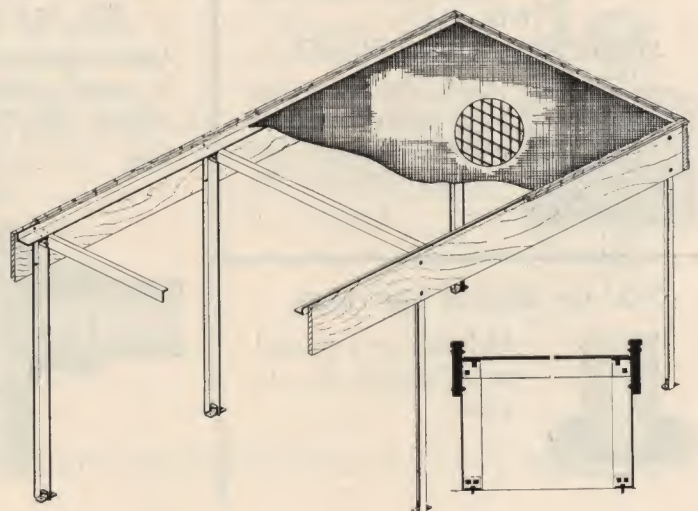


## HEAVY DUTY COMMERCIAL BENCH

At the left is a popular type bench in common usage. Tile legs are illustrated, but concrete blocks or other materials can be used. 2 x 4's are used as lengthwise stringers, with legs spaced 4 ft. apart. 2 x 4" crosspieces are spaced 2 ft. apart. See page 32 for bench materials required.

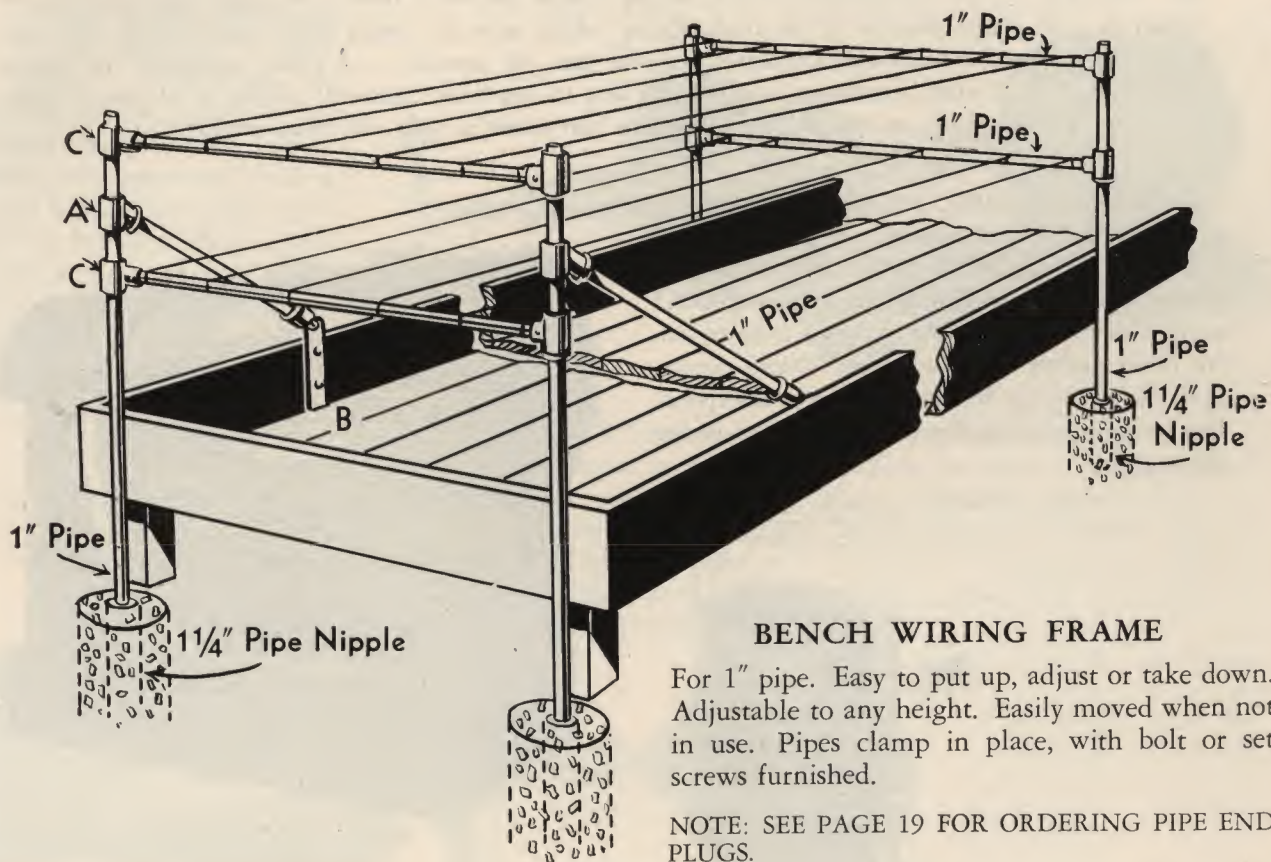
## ORCHID BENCH

Steel frame bench designed especially for use in orchid greenhouses. A steel mesh bottom provides maximum air circulation for proper plant growth. Made to order for each individual greenhouse. Advise as to length, width and height desired. Include a rough sketch to indicate installation in your greenhouse. We then will be able to quote specific prices.





# QUALITY BENCH MATERIALS



## BENCH WIRING FRAME

For 1" pipe. Easy to put up, adjust or take down. Adjustable to any height. Easily moved when not in use. Pipes clamp in place, with bolt or set screws furnished.

NOTE: SEE PAGE 19 FOR ORDERING PIPE END PLUGS.



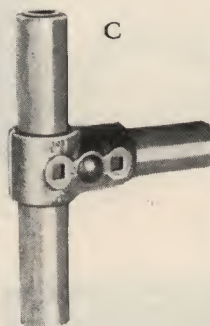
### NO. 434 SIDE BRACE FITTING

1" gray iron, painted. Clamps side brace to upright pipe. Galvanized bolt included.



### NO. 435 SIDE BRACE ANCHOR

1" malleable iron socket, steel brace bolts to sideboard. Painted. Galvanized bolts included.



### NO. 338 SPLIT TEE

1" malleable iron, painted. Order two for each crosspiece. Galvanized bolt included.



### NO. 436 NATIONAL BENCH MASTIC

Waterproof your wood benches this sure, safe way. Has asphalt base, sticks readily to wood, metal, glass and concrete, too. Will not harm vegetation when dry. Apply with trowel or heavy brush. 5 gallon can will cover 100-125 square ft., 1/16" thick. Also available in 55 gal. drum.

### NO. 437 ASPHALT TREATED FABRIC

For use with the National bench mastic for sealing wide cracks or decayed spots in benches or gutters. Spread mastic around hole or crack, then press fabric down on mastic and allow to set for 30-40 minutes. Then apply a second coat of mastic and the job is finished. Fabric is cut into 4 inch strips, packed in 150 ft. rolls.



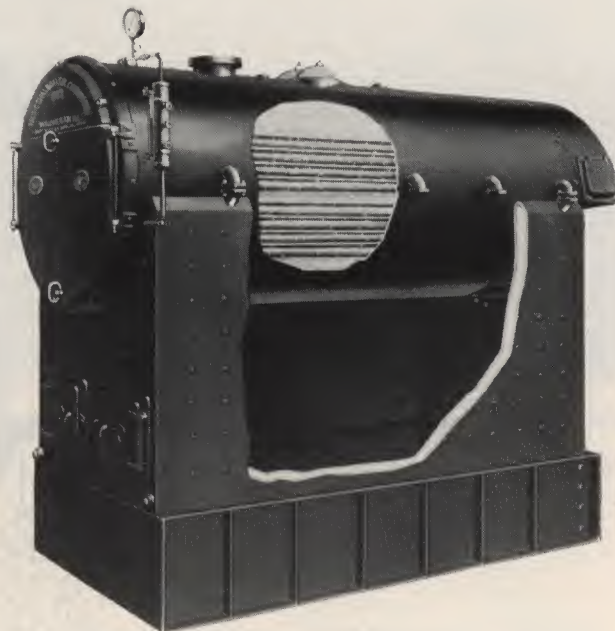
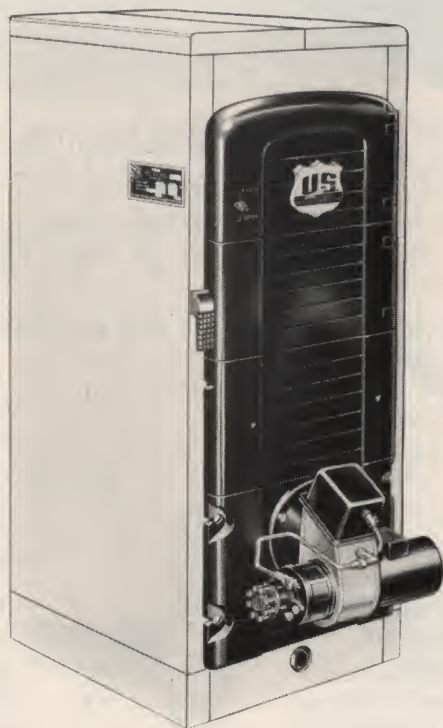


# DESIGNED FOR *QUALITY* AND *ECONOMY*!

The "watchdog" of your greenhouse is your heating system, because it insures, to a great extent, the proper growth of your plants. Because of the responsibility which must be placed upon your heating unit, your choice of the system and accessory equipment to do the best job possible is of prime importance. In heating equipment as in all other greenhouse material, it's best to buy from National! Advise us of your requirements and we will gladly recommend the equipment best suited to your individual needs.

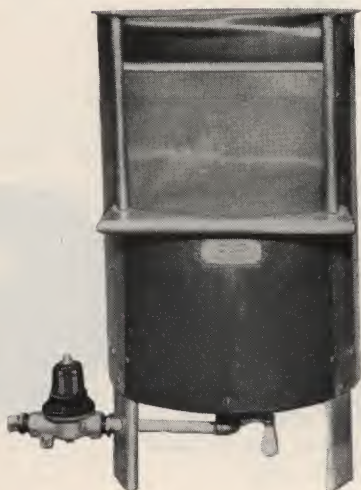
## No. 440 PACIFIC STEEL BOILERS

For stoker, gas, oil or hand-firing. Famous for reliability and economy, Pacific boilers are built entirely of steel, electrically welded for greater strength and safety with Pacific's exclusive two-piece construction. All Pacific boilers have the famous "forced circulation" design feature for maximum heat absorption. Hot water or steam boilers can be furnished in any size required.



## No. 441 U.S. RADIATOR CORP. CAST-IRON BOILERS

A complete line of boilers, built for firing with stoker, oil, gas, or by hand. Hot water or steam types available, covering a wide range of sizes. The latest in design and construction features. Designed for economical operation and a lifetime of service. Specific quotations furnished on request.



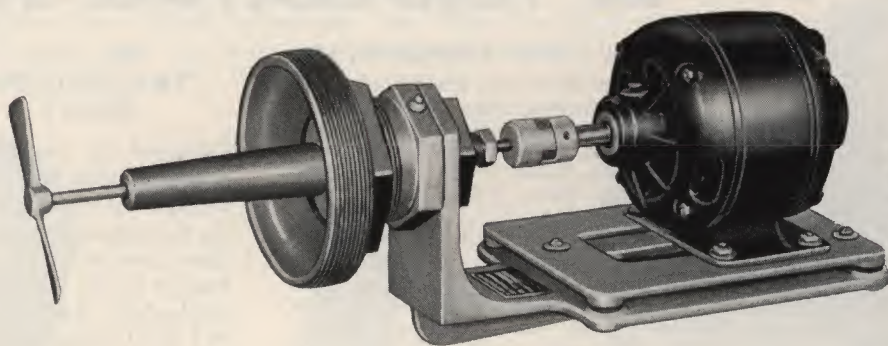
## No. 442 MODEL "C" GAS UNIT HEATER

If natural gas or a mixture of natural and manufactured gas is available as fuel, gas unit heaters may well be your most economical means of heating . . . especially if you have a small greenhouse. All aluminum construction, 13" in diameter and 22" high. Designed to set under greenhouse benches and throw the heat out into the walk. Furnished with manual or automatic control.

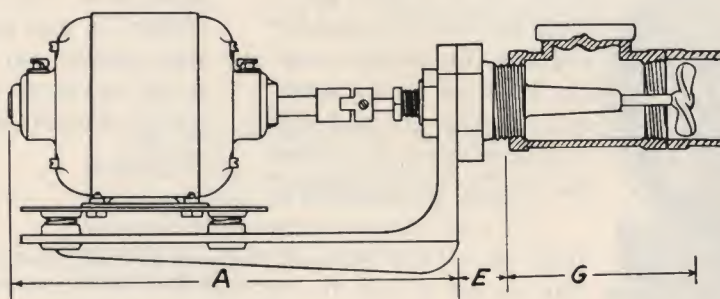
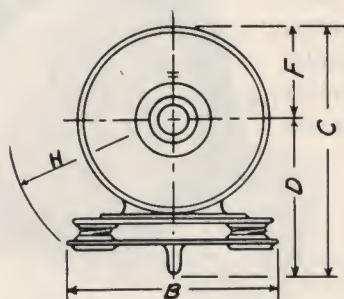
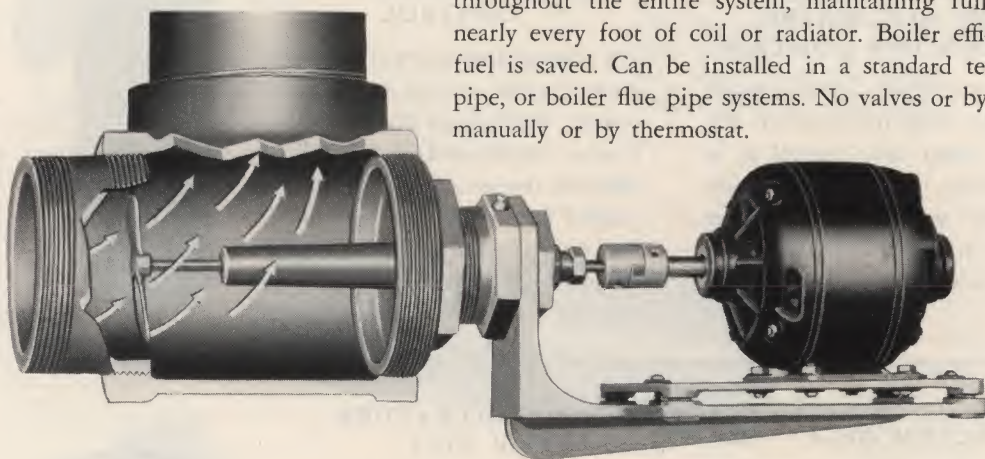


# No. 443 ROCHESTER CIRCULATOR

If the gravity hot water heating system in your greenhouse is sluggish . . . uneven . . . a fuel waster, then National has the answer to your problem. Now you can have a modern, up-to-date system and put an end to fuel waste simply by installing a ROCHESTER Hot Water Circulator. Your assurance of even temperature for proper growth, ROCHESTER Circulators pay for themselves in fuel saved.



The ROCHESTER Circulator is not a pump and therefore does not build up harmful pressure in the piping. It propels the water, at high speed, throughout the entire system, maintaining full boiler temperature on nearly every foot of coil or radiator. Boiler efficiency is increased, thus fuel is saved. Can be installed in a standard tee in threaded pipe, soil pipe, or boiler flue pipe systems. No valves or by-passes. Can be operated manually or by thermostat.



(dimensional line drawing of circulator)

TABLE OF SIZES AND CAPACITIES

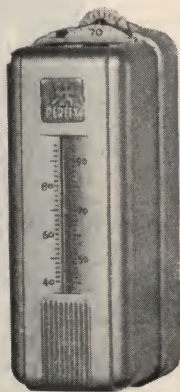
| Circulator Size | Tee Sizes     | Bushing We Supply | Machine Screws Into | Dimensions In Inches |    |     |    |    |    |     |    | Motor H. P. |
|-----------------|---------------|-------------------|---------------------|----------------------|----|-----|----|----|----|-----|----|-------------|
|                 |               |                   |                     | A                    | B  | C   | D  | E  | F  | G   | H  |             |
| 1½"             | 1½ x 1½ x 1½" | None              | 1½"                 | 12¼                  | 6⅝ | 8   | 5¼ | 1½ | 2¾ | 3¼  | 5½ | 1/12        |
| 2"              | 2 x 1½ x 2"   | None              | 1½"                 | 12¼                  | 6⅝ | 8   | 5¼ | 1½ | 2¾ | 3¾  | 5  | 1/12        |
| 2½"             | 2½ x 1½ x 2½" | None              | 1½"                 | 12¼                  | 6⅝ | 8   | 5¼ | 1½ | 2¾ | 4½  | 5½ | 1/12        |
| 3"              | 3 x 2 x 3"    | None              | 2"                  | 12¼                  | 6⅝ | 8   | 5¼ | 1½ | 2¾ | 5¼  | 5½ | 1/12        |
| 4"              | 4 x 3 x 4"    | None              | 3"                  | 14½                  | 8  | 9¼  | 6  | 2  | 3¼ | 6½  | 6½ | ¼           |
| 5"              | 5 x 5 x 5"    | 5 x 3"            | 3"                  | 14½                  | 8  | 9¼  | 6  | 2½ | 3¼ | 7½  | 7½ | ¼           |
| 6"              | 6 x 6 x 6"    | 6 x 3"            | 3"                  | 14½                  | 8  | 9¼  | 6  | 2½ | 3¼ | 9   | 7½ | ¼           |
| 8"              | 8 x 8 x 8"    | 8 x 3"            | 3"                  | 19                   | 9¼ | 12¼ | 6¼ | 2½ | 6  | 11¾ | 7¼ | ½           |

All circulators are equipped with split phase, 110 volt, A. C., 60 cycle, 1725 R.P.M. motors.

NATIONAL GREENHOUSE CO.



# Precision **CONTROL** and **TEMPERATURE EQUIPMENT**



## No. 444 MAGIC DIAL THERMOSTAT

Low voltage, two-wire, heater-type which can be used for oil, gas or coal. Famous magic dial adjustment enables you to tune the "on" period of your heating system to meet heating requirements of your greenhouse. Easily installed. Range 55°-85° F. Use with No. 446 Transformer Relay. Opens circuit on rise.

## No. 445 LINE VOLTAGE THERMOSTAT

Heavy duty, two-wire, non-heater type actuated by a sensitive vapor-filled, bellows-type element. Designed for line voltage loads where relays are not used. Adaptable for use with any type heating system, including unit heaters. Range 40°-70° F., or 55°-85° F. Opens circuit on rise.

## No. 446 TRANSFORMER RELAY

Designed for use with a two-wire, snap-action, low voltage operating control for the operation of single-phase motors or other line voltage loads: single-pole, single-throw. Approximately 1 H. P. rating. Operates off 115 V. power supply.



## No. 447 IMMERSION TYPE HOT WATER TEMPERATURE CONTROL

Bi-metal actuated Twin Contact single-pole, single-throw switch. For use as a safety limit control or as an operating control on summer-winter hot water systems. Range 90°-250° F. Opens circuit on rise. Operates off 115 V. power supply.

## No. 448 STRAP-ON HOT WATER TEMPERATURE CONTROL

For use on line or low voltage circuits as either a limit or operating control. Features an enclosed Twin Contact switch and is available in direct or reverse action models. This control is recommended for use on hot water heating systems. Opens circuit on rise. Range 110°-240° F. Operates off 115 V. power supply.



## No. 449 TEMPERATURE ALARM GH-3

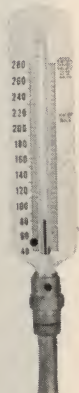
Designed especially for greenhouse use. Protects against fire and frost. An absolute necessity where mechanical stokers or oil burners are used. Bell rings to warn you of a sudden rise or fall in temperature.

## No. 450 TEMPERATURE ALARM GH-4

Heavy-duty temperature alarm, enclosed in steel case, furnished with padlock and key. Similar to No. 449 except contact hands can be changed only by person with key.

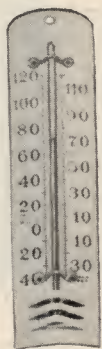


*Order No. 451 4" Edwards bell and No. 452 temperature alarm wire, in 100 ft. rolls, for use with the above temperature alarms.*



## No. 453 HOT WATER THERMOMETER

Straight hot water thermometer for use in boiler or wherever temperature readings are required. Range 40°-280° F. Readings black on white enamel base. Requires 1/2" tapping.



## No. 454 THERMOMETER

6" white lacquered steel base. Alternating scale and numerals in black. Range -40° to +120° F. in 2 degree divisions.



## No. 455 THERALTIMETER

Combination water temperature and pressure indicator for use on hot water boilers. 3/4" tapping required.



# BELL and GOSSETT HOT WATER SPECIALTIES

Our experience through many years of trouble-free service is your assurance that the Bell and Gossett products described on this page are the finest for greenhouse use. We recommend their installation wherever possible. The illustration at the right shows these Bell and Gossett products in use in a typical greenhouse heating system.



**No. 460 BOOSTER PUMP**

For use in forced hot water heating systems. Assures fast and positive circulation in every coil or radiator and permits boiler to be installed at greenhouse floor level if desired. Sizes from 1" through 3".



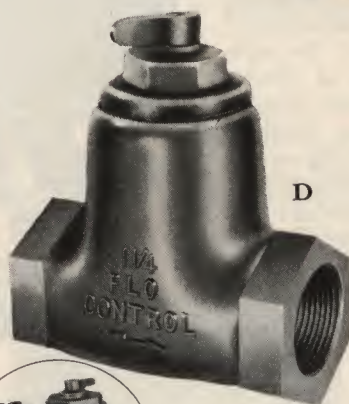
**No. 461 AUTOMATIC AIR VENT**

Automatically removes air from piping in any type of hot water heating system. Used with a 1/8" close nipple.



**No. 462 COMPRESSION TANK**

The use of a compression tank on closed hot water heating systems is essential. The tank provides for an air cushion against the expansion of heated water. Saves water and fuel. Tank capacities range from 8 to 80 gallons.



**Straight Pattern**



**Angle Pattern**

**No. 463 FLO-CONTROL VALVES**

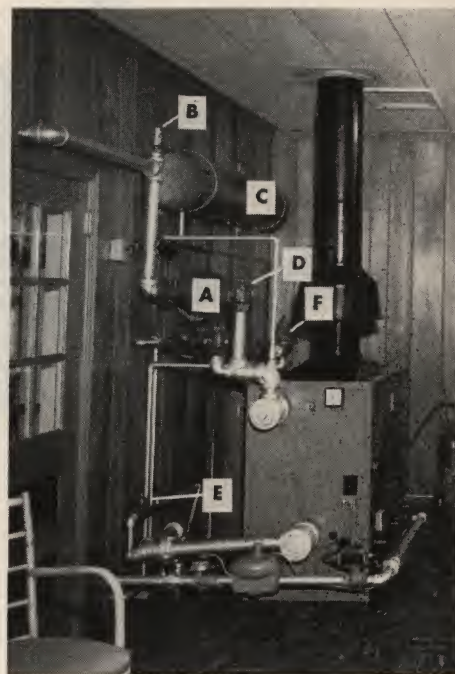
Straight and angle patterns. Used in forced hot water heating systems to prevent the circulation of hot water when heat is not needed in the greenhouse. Angle pattern valve designed for use where an angle valve is easier to install.

**No. 464 REDUCING VALVE**

Connects with and automatically feeds water into your hot water heating system. Constant water pressure greater than 12 pounds is required. Available in 1/2" and 3/4" sizes.

**No. 465 SAFETY RELIEF VALVES**

Designed and built to ASME requirements. Automatically relieves excessive pressure on your heating system. Set to operate at 30 lbs. pressure. 3/4" size.

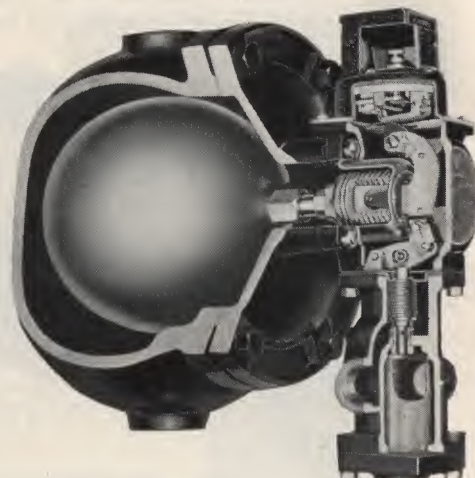
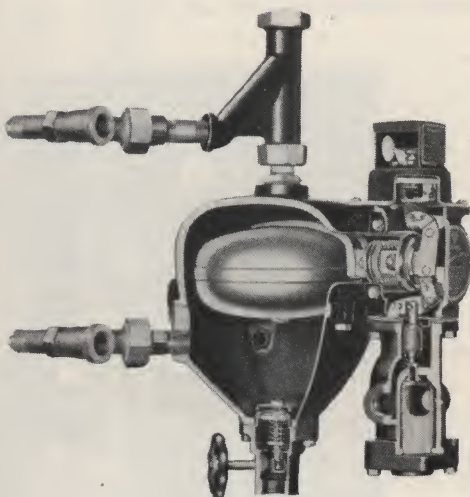




# LOW PRESSURE STEAM SYSTEM SPECIALTIES

## No. 466 WATER FEEDER CUT-OFF COMBINATION

Used on hand-fired boilers to admit water automatically to boiler when water level drops to minimum for safe operation. Same water feeder (with cut-off switch) available for automatically fired boilers. Whenever water level falls to  $\frac{1}{4}$ " in gauge glass, the cut-off switch interrupts current to the firing device until the emergency has passed. Cut-off has low voltage alarm terminals for connection of alarm if desired. For boilers up to 5000 sq. ft. and 25 lbs. steam pressure. Use  $\frac{1}{2}$ " water feed line on both types. Made by McDonnell and Miller.

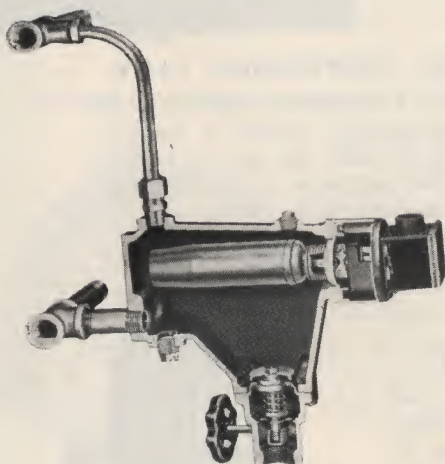


## No. 467 WATER FEEDER CUT-OFF COMBINATION

Similar in operation to No. 466. For boilers having greater than 5000 sq. ft. rating and up to 35 lbs. steam pressure. For hand or automatically fired boilers. Use  $\frac{3}{4}$ " water feed line.

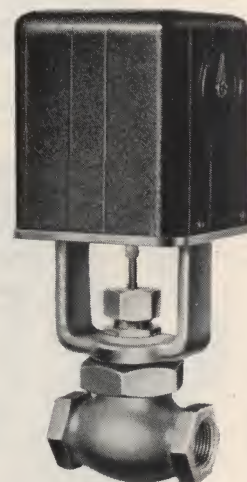
## No. 468 LOW WATER FUEL CUT-OFF

A necessity for automatically fired steam boilers. If the water in the boiler drops too low this device automatically sounds an alarm and stops automatic firing. For boilers of any size and up to 20 lbs. steam pressure made by McDonnell and Miller. (Temperature alarm bell illustrated on Page 38 can be used with this cut-off.)



## No. 469 MOTORIZED VALVE

Brass body valve manufactured by Hoffman. Available in sizes from  $\frac{1}{2}$ " to 2" inclusive for automatic control of various temperature zones in steam heating systems. Ideal for use in maintaining varying degrees of temperature in various houses of your greenhouse unit. Operates on low voltage—25 volt 60 cycle. Single phase A.C.



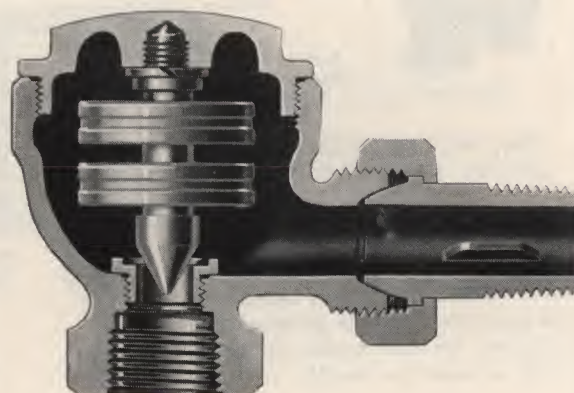
## No. 470 AIR VENT

Automatically relieves air from steam mains. Brass body, nickel trim.  $\frac{3}{4}$ " male connection. Made by Hoffman.



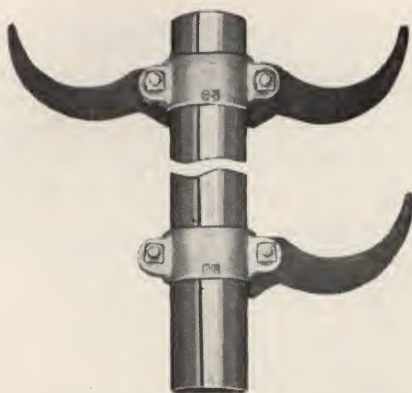
## No. 471 ANGLE STEAM TRAP

Hoffman angle type low pressure steam trap. Brass body with non-corrosive thermostat, pin and seat. Thermostat and seat are both renewable. Capacity 200 square feet E.D.R., 15 lb. pressure.  $\frac{1}{2}$ " pipe connections.



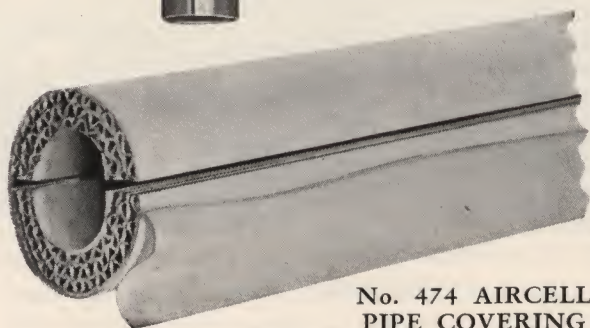


# Buy **NATIONAL** For Your Heating Supplies



**No. 472 PIPE CARRIERS**

Single or double, for pipe posts. Clamp on 1, 1-1/4, 1-1/2 or 2 inch pipe post. Carry 2 to 4 inch size pipe.

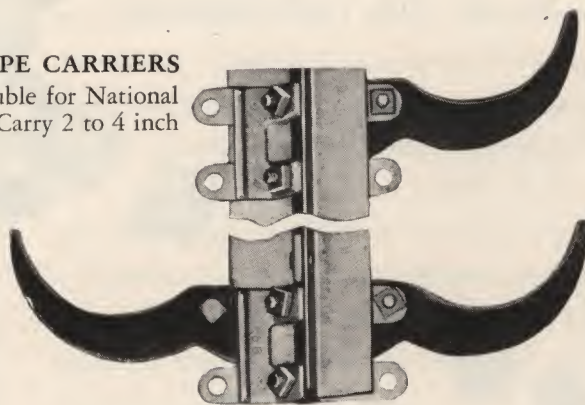


**No. 474 AIRCELL  
PIPE COVERING**

A light, durable, fireproof pipe covering for low-pressure steam, hot water or vapor pipes. Furnished in sizes to fit all standard pipes, regular canvas jacket or white glazed finish. Comes complete with non-corrosive, rust-proof aluminum bands. 3 ply, 3/4" thick. Sold in multiples of 3 ft. lengths only.

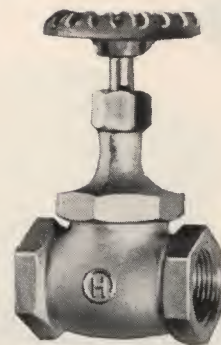
**No. 473 PIPE CARRIERS**

Single or double for National "Star" post. Carry 2 to 4 inch size pipe.



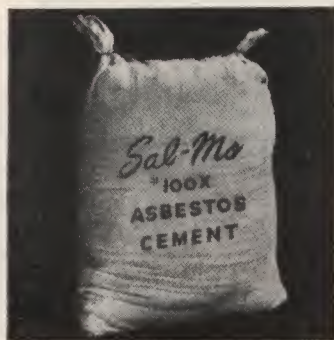
**No. 478 GLOBE  
VALVE**

Brass body, renewable disc Hammond valves for use on steam heating systems. Sizes from 3/8" through 2".



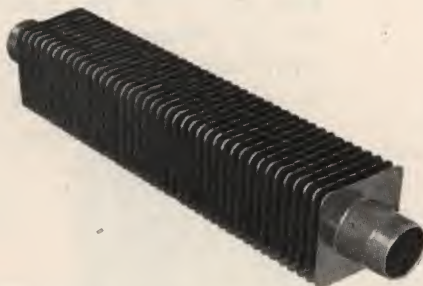
**No. 476 FLUE BRUSH**

It pays to keep the inside of your boiler clean. Use this brush on cast iron boilers. Made in small and large sizes.



**No. 475  
ASBESTOS CEMENT**

An all-asbestos fiber cement that meets every requirement and condition. Mix with water to the consistency of mortar for easy application. 50 and 100 pound bags.



**No. 477 FIN RAY  
RADIATION**

A new type radiation device which is becoming increasingly popular for greenhouse use. Has several times the radiating surface of 2" pipe in each linear foot. Advise us of your requirements and we will furnish complete information and prices.



**NO. 479  
GATE VALVE**

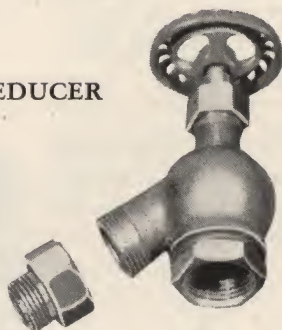
Brass body, non-rising stem Hammond valve. For use on water supply lines and hot water heating systems.



# NATIONAL *Your Assurance of Quality*

## No. 481 HOSE VALVE REDUCER

Brass connection used on  $\frac{3}{4}$ " hose when hose is connected to 1" valve.



## No. 480 HOSE VALVE

High quality material and workmanship. Brass body, with full size waterways, large easy-grip handle. Designed with bent nose to do away with sharp bends in hose which cause breakage. Made for  $\frac{3}{4}$ " pipe and  $\frac{3}{4}$ " hose, 1" pipe and  $\frac{3}{4}$ " hose, and for 1" pipe and 1" hose.

## No. 482 HOSE VALVE WASHERS

Leather disc washers for replacement in hose valves.  $\frac{3}{4}$ " and 1" sizes.



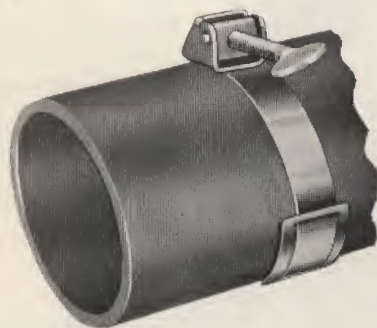
## No. 484 WATERING AND HUMIDIFICATION NOZZLE

$\frac{1}{4}$ " brass nozzle with Monel strainer. Designed to break water into a fine spray using nozzles on regular water pressure lines . . . no water pressure booster required. Sprays from 1.03 gallons per hour at 25 lbs. pressure to 1.62 gallons at 60 lbs. pressure. Maximum pressure, 100 lbs. An ideal aid in propagation of cuttings, such as azaleas, hydrangeas, etc. Screws into standard  $\frac{1}{4}$ " pipe threads.



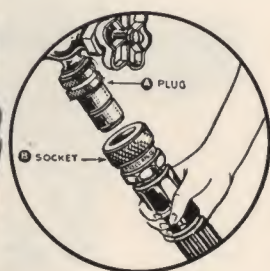
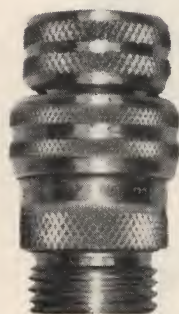
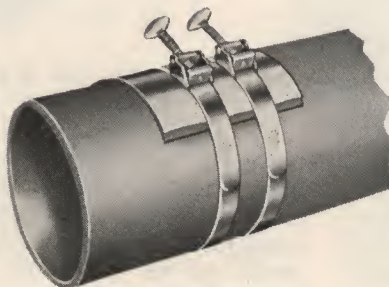
## No. 485 AND No. 486 PIPE LEAK CLAMPS

All stainless steel, single and double. Designed to stop pipe leaks up to 240 lbs. pressure. Pad  $\frac{1}{8}$ " Perbunan resistant to water, steam, oil, gas, etc. Can be reused many times. Order a stock of these fine clamps for emergency use.



No. 485 pipe leak clamp. Adjustable from  $\frac{3}{4}$ " to 2" inclusive or from  $\frac{3}{4}$ " to 4". Packed two in a bag.

No. 486 pipe leak clamp. Adjustable from  $\frac{3}{4}$ " to 2" inclusive or from  $\frac{3}{4}$ " to 4". Packed one in a bag.



The "Lightning Way". Just slip it on or off. . . . automatically locks in place.

## No. 483 "LIGHTNING" HOSE COUPLING

Precision machined from solid brass stock. Stainless steel ball bearings and springs. Exclusive leak-proof features. Fits  $\frac{3}{4}$ " valve and  $\frac{3}{4}$ " hose. Additional plugs and sockets available.



# HUMIDIFICATION EQUIPMENT

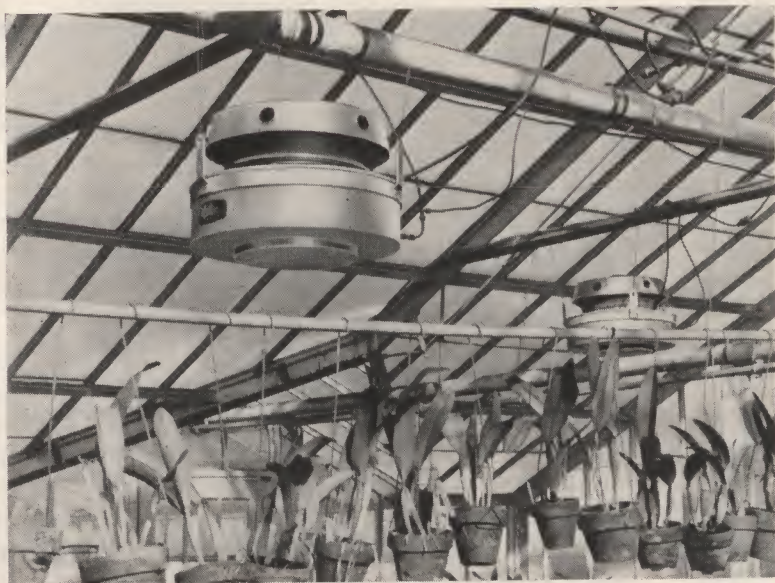


Photo above shows two Walton Humidifiers installed in an orchid greenhouse.

A humid atmosphere in the greenhouse is essential to healthy plant life. It helps control the rate the foliage retains or gives off moisture. It takes a fresh atmosphere laden with the right amount of moisture, therefore, to produce that thick, vigorous growth you always admire in greenhouse plants. Walton humidification equipment is scientifically designed to assure your plants proper moisture. All items illustrated on this page, with the exception of the Hygrometer, are manufactured by Walton Laboratories.



**No. 487 HUMIDIFIER**

10-1/4" diameter, 10" high. Vaporizes 1-1/2 pints of water per hour. Uses 115 V., 60 cycle A.C. drawing approximately 30 watts electric current. Can be wired with humidistat for automatic control. Available with regular or directional dome.

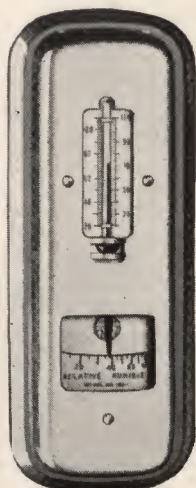


**No. 488 HUMIDIFIER**

14-1/2" diameter, 10-1/2" high. Vaporizes 1/2 gallon of water per hour, using 115 V., 60 cycle A.C. current. Can be wired with humidistat for automatic control. Larger model available for vaporizing 1 gallon per hour.

REGULAR DOME

DIRECTIONAL DOME



**No. 489 HUMIDITY INDICATOR**

Enables you to read, at a glance, temperature and relative humidity. Sensitive element is human hair.

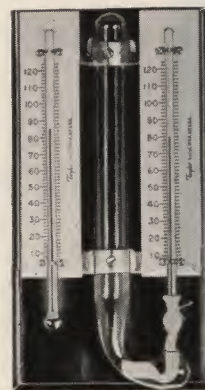


**No. 490 HUMIDISTAT**

Hair element type instrument which connects with humidifier for accurate automatic control. Mercury switch humidistat also available.

**No. 491  
HYGROMETER**

Gives the relative humidity in your greenhouse. 4-1/2" x 8-1/2". Mahogany base on which cistern and wet and dry thermometers are mounted. Thermometer readings are etched on brass plates in large figures. Two wicks and easy-to-read chart furnished. Insured against damage in transit.





# Plan It . . . Buy It . . .

NATIONAL GREENHOUSE CO. has designed this complete line catalog in hopes that it will make your task of choosing the necessary materials to build your own greenhouse as simple as possible. With the information on these and the preceding pages you can plan your greenhouse and prepare an accurate listing of the materials you need to complete the job. Then refer to the price list which accompanies this catalog, insert the prices according to the size and amount you require, total the cost and you're ready to order.

*National* recommends the following procedure in building your own greenhouse:

1) Decide on the width and length. Note the tables below for the standard widths of both straight roof and leanto houses. (See page 17 for sketches of standard width houses.) Length can be in even lights as desired, but if *National* steel items (eaves, sills, etc.) are used, the house should be kept in even six-light sections long. See standard lengths table below. The widths shown are the most commonly used. They're economical, too, because the roof bars cut out with little or no waste and the runs of glass work nicely

with a minimum of cutting and piecing. The benches will afford a maximum of planting space with the usual width for walks. (Special width houses are available to suit any piece of ground you may have. Send us the data and we will be glad to design your house accordingly.)

If you're planning a leanto house, we suggest not making the roof too flat. In the table below we show how high the high side should be, based on the low side being 5 ft. If you wish to make the roof more flat, cut down the low side, rather than the high side, to prevent leakage.

2) See the tables below for the number of roof bars, wall posts, inside posts, braces and ridge ties needed. Also for the length and sizes of pipe to use for your pipe framework. Length of roof bars for any width house are shown in the two standard width tables. It should be noted that the lengths shown for roof bars is the length needed before bars are cut to exact length. In pricing roof bars, figure the length as shown in the tables.

3) It is almost universal custom to use 3 feet of glass or sash in each side wall. In the case of leanto houses, 2 ft. of glass and 3 ft. of foundation wall is customary. You would thus

## STANDARD GREENHOUSE WIDTHS (Extreme Outside)

### STRAIGHT ROOF HOUSES USING VARIOUS EAVES AND GUTTERS

| No. 168 Wood Eave | With Wood Gutter | With Steel Eave | With Steel Gutter | Length of Roof Bar |
|-------------------|------------------|-----------------|-------------------|--------------------|
| 11' 3"            | 11' 10"          | 10' 6"          | 11' 11"           | 6'                 |
| 14' 7"            | 15' 2"           | 13' 10"         | 15' 3"            | 8'                 |
| 18' 3"            | 18' 10"          | 17' 6"          | 18' 11"           | 10'                |
| 21' 10"           | 22' 5"           | 21' 1"          | 22' 6"            | 12'                |
| 25' 3"            | 25' 10"          | 24' 6"          | 25' 11"           | 14'                |
| 28' 9"            | 29' 4"           | 28' 0"          | 29' 5"            | 16'                |
| 32' 9"            | 33' 4"           | 32' 0"          | 33' 5"            | 18'                |
| 36' 1"            | 36' 8"           | 35' 4"          | 36' 9"            | 20'                |

### LEANTO HOUSES USING VARIOUS EAVE PLATES

| No. 168 Wood Eave | Height of Ridge | With Steel Eave | Height of Ridge | Height of Eave | Length of Roof Bar |
|-------------------|-----------------|-----------------|-----------------|----------------|--------------------|
| 5' 7"             | 8' 2"           | 5' 2"           | 7' 10"          | 5'             | 6'                 |
| 7' 5"             | 9' 0"           | 7' 0"           | 9' 9"           | 5'             | 8'                 |
| 9' 2"             | 10' 0"          | 8' 9"           | 9' 7"           | 5'             | 10'                |
| 10' 8"            | 10' 7"          | 10' 3"          | 10' 4"          | 5'             | 12'                |
| 12' 9"            | 11' 8"          | 12' 4"          | 11' 4"          | 5'             | 14'                |
| 14' 7"            | 12' 7"          | 14' 2"          | 12' 3"          | 5'             | 16'                |
| 16' 4"            | 13' 5"          | 15' 11"         | 13' 1"          | 5'             | 18'                |

## STANDARD LENGTH HOUSES AND POST SPACING

This Table Shows Standard Lengths. Also Number of Wall and Interior Posts in Each Row. Double the Number of Posts for 2 Walls, and so on.

| Length of House | Wall Posts with Steel Eave or Gutter One Wall | Wall Posts with Wood Eave or Gutter One Wall | Inside Posts Each Row | Cross Braces for Inside Posts | Ties to Ridge |
|-----------------|---|--|-----------------------|-------------------------------|---------------|
| 8' 7"           | 2   | 2  | 0                     | 0                             | 0             |
| 17' 0"          | 3   | 3  | 1                     | 1                             | 1             |
| 25' 4"          | 4   | 5  | 2                     | 2                             | 2             |
| 33' 8"          | 5   | 6  | 3                     | 3                             | 3             |
| 42' 0"          | 6   | 7  | 4                     | 4                             | 4             |
| 50' 4"          | 7   | 8  | 5                     | 5                             | 5             |
| 58' 8"          | 8   | 9  | 6                     | 6                             | 6             |
| 67' 0"          | 9   | 10   | 7                     | 7                             | 7             |
| 75' 4"          | 10  | 11   | 8                     | 8                             | 8             |
| 83' 8"          | 11  | 12   | 9                     | 9                             | 9             |
| 92' 0"          | 12  | 13   | 10                    | 10                            | 10            |
| 100' 4"         | 13  | 14   | 11                    | 11                            | 11            |
| 108' 8"         | 14  | 15   | 12                    | 12                            | 12            |

## PIPE ROOF PURLINS NEEDED

| STRAIGHT ROOF HOUSES |                               | LEANTO HOUSES  |                               |
|----------------------|-------------------------------|----------------|-------------------------------|
| Width of House       | Number & Size of Pipe Purlins | Width of House | Number & Size of Pipe Purlins |
| 11'-3"               |                               | 5'-7"          |                               |
| 14'-7"               | 2-1 1/4"                      | 7'-5"          | 1-1 1/4"                      |
| 18'-3"               | 2-1 1/4"                      | 9'-2"          | 1-1 1/4"                      |
| 21'-10"              | 2-1 1/4"                      | 10'-8"         | 2-1 1/4"                      |
| 25'-3"               | 2-1" & 2-1 1/4"               | 12'-9"         | 2-1 1/4"                      |
| 28'-9"               | 2-1" & 2-1 1/4"               | 14'-7"         | 2-1 1/4"                      |
| 32'-9"               | 4-1 1/4"                      | 16'-4"         | 2-1 1/4"                      |
| 36'-1"               | 4-1 1/4"                      |                |                               |



# .. Build It With NATIONAL

have a regulation 6 foot side wall made up of 3 feet of glass and 3 feet of foundation wall. The proportion of glass or foundation can be changed to suit your particular need. For example, in a 5 ft. wall (ground to eave) you could have 3 lights of 18" glass up and down for a total of 54" and below this use a foundation wall 18" high, or any other division you may want. Figure the length of side bar to suit the amount of glass used.

4) You can now prepare your list of the material needed to complete your greenhouse. Starting with Section 1, list the items you need from each section, noting carefully the instructions connected with each item. Any materials you may have on hand can be omitted on your list.

After you have your list figured and total cost determined it would be a good idea for you to refer to price list on our complete steel framed houses and compare your figures with the prices of our stock models of the same width and length. In many cases, it will be to your advantage to purchase stock models.

If you would like to have us check your list and prices we

will gladly do so; in fact, if you will just send us the width and length of the house you want, how many gable ends you desire, how you want the side walls arranged, whether single or double roof ventilation and also tell us of any special features you have in mind, we will make an estimate, and a sketch if needed, and send it to you promptly.

If possible, we suggest you let us cut materials to fit, ready for you to put them up. We can cut the roof bars at each end and also the bars for the side walls. The bars for the gable can be cut at the lower end. Our charge for this is very small, and we will furnish a plan that will simplify your building job.

All woodwork, such as gutters, eaves, wall sills and headers will be sent spliced and ready to use, also the ridge or ridge and cap. Pipe can be ordered cut to proper lengths for the wall posts, inside posts, cross braces and knee braces. Purlin and shafting comes in stock lengths.

We hope that these suggestions will assist you in the construction of your greenhouse, and that you will feel free to call on us at any time for additional information.

## HOW TO FIGURE LENGTH AND SIZES OF PIPE FRAME

These Pipe Lengths and Sizes are based on a height of 6 ft. from ground to Eave for "Straight Roof" Houses and 5 ft. for Leanto Houses. Add to or deduct from length of Posts if Eave is higher or lower.

### FOR STRAIGHT ROOF HOUSES

| Width of House | Size & Length Wall Posts | Size & Length Inside Posts | Size & Length Cross Braces | Size & Length Knee Braces | Size & Length Ridge Tie Rod |
|----------------|--------------------------|----------------------------|----------------------------|---------------------------|-----------------------------|
| 11'- 3"        | 2"-8'-0"                 |                            | Use Wire Tie               |                           |                             |
| 14'- 7"        | 2"-8'-0"                 | 1 1/4"-10'-0"              |                            | 1"-3'-4"                  |                             |
| 18'- 3"        | 2"-8'-0"                 | 1 1/4"-11'-0"              |                            | 1"-4'-0"                  |                             |
| 21'-10"        | 2"-8'-0"                 | 1 1/4"- 9'-6"              | 1 1/4"- 9'-9 1/2"          |                           |                             |
| 25'- 3"        | 2"-8'-0"                 | 1 1/4"- 9'-6"              | 1 1/4"-13'-9 1/2"          | 1"-3'-8"                  | 3/8"-4'-6"                  |
| 28'- 9"        | 2"-8'-0"                 | 1 1/4"- 9'-6"              | 1 1/4"-16'-5 1/2"          | 1"-4'-0 3/4"              | 3/8"-5'-0"                  |
|                |                          | 1 1/4"- 9'-6"              |                            |                           |                             |
| 32'- 9"        | 2"-8'-0"                 | 1 1/2"-12'-0"              | 1 1/4"-10'-5 1/2"          |                           |                             |
|                |                          | 1 1/4"- 9'-6"              |                            |                           |                             |
| 36'- 1"        | 2"-8'-0"                 | 1 1/2"-12'-6"              | 1 1/4"-11'-9 1/2"          |                           |                             |

### FOR LEANTO HOUSES

|        |              |               |  |          |  |
|--------|--------------|---------------|--|----------|--|
| 5'-7"  | 1 1/2"-7'-0" |               |  |          |  |
| 7'-5"  | 1 1/2"-7'-0" | 1 1/4"- 8'-0" |  |          |  |
| 9'-2"  | 1 1/2"-7'-0" |               |  | 1"-4'-6" |  |
|        |              | 1 1/4"- 7'-6" |  |          |  |
| 10'-8" | 1 1/2"-7'-0" | 1 1/4"-10'-0" |  |          |  |
|        |              | 1 1/4"- 8'-6" |  |          |  |
| 12'-9" | 1 1/2"-7'-0" | 1 1/4"-10'-6" |  |          |  |
|        |              | 1 1/4"- 8'-6" |  |          |  |
| 14'-7" | 1 1/2"-7'-0" | 1 1/4"-10'-6" |  |          |  |
|        |              | 1 1/4"- 8'-0" |  |          |  |
| 16'-4" | 1 1/2"-7'-0" | 1 1/4"-11'-0" |  |          |  |

## ROOF BARS NEEDED FOR VARIOUS LENGTH HOUSES Using Glass 16 Inches Wide.

| Length of House Outside | Rows of Glass | Roof Bars Required | Length of House Outside | Rows of Glass | Roof Bars Required |
|-------------------------|---------------|--------------------|-------------------------|---------------|--------------------|
| 4' 5 3/16"              | 3             | 2                  | 53' 1 4/16"             | 38            | 37                 |
| 5' 9 14/16"             | 4             | 3                  | 54' 5 15/16"            | 39            | 38                 |
| 7' 2 9/16"              | 5             | 4                  | 55' 10 10/16"           | 40            | 39                 |
| 8' 7 4/16"              | 6             | 5                  | 57' 3 5/16"             | 41            | 40                 |
| 9' 11 15/16"            | 7             | 6                  | 58' 8"                  | 42            | 41                 |
| 11' 4 10/16"            | 8             | 7                  | 60' 0 11/16"            | 43            | 42                 |
| 12' 9 5/16"             | 9             | 8                  | 61' 5 6/16"             | 44            | 43                 |
| 14' 2"                  | 10            | 9                  | 62' 10 1/16"            | 45            | 44                 |
| 15' 6 11/16"            | 11            | 10                 | 64' 2 12/16"            | 46            | 45                 |
| 16' 11 6/16"            | 12            | 11                 | 65' 7 7/16"             | 47            | 46                 |
| 18' 4 1/16"             | 13            | 12                 | 67' 0 2/16"             | 48            | 47                 |
| 19' 8 12/16"            | 14            | 13                 | 68' 4 13/16"            | 49            | 48                 |
| 21' 1 7/16"             | 15            | 14                 | 69' 9 8/16"             | 50            | 49                 |
| 22' 6 2/16"             | 16            | 15                 | 71' 2 3/16"             | 51            | 50                 |
| 23' 10 13/16"           | 17            | 16                 | 72' 6 14/16"            | 52            | 51                 |
| 25' 3 8/16"             | 18            | 17                 | 73' 11 9/16"            | 53            | 52                 |
| 26' 8 3/16"             | 19            | 18                 | 75' 4 4/16"             | 54            | 53                 |
| 28' 0 14/16"            | 20            | 19                 | 76' 8 15/16"            | 55            | 54                 |
| 29' 5 9/16"             | 21            | 20                 | 78' 1 10/16"            | 56            | 55                 |
| 30' 10 4/16"            | 22            | 21                 | 79' 6 5/16"             | 57            | 56                 |
| 32' 2 15/16"            | 23            | 22                 | 80' 11"                 | 58            | 57                 |
| 33' 7 10/16"            | 24            | 23                 | 82' 3 11/16"            | 59            | 58                 |
| 35' 0 5/16"             | 25            | 24                 | 83' 8 6/16"             | 60            | 59                 |
| 36' 5"                  | 26            | 25                 | 85' 1 1/16"             | 61            | 60                 |
| 37' 9 11/16"            | 27            | 26                 | 86' 5 12/16"            | 62            | 61                 |
| 39' 2 6/16"             | 28            | 27                 | 87' 10 7/16"            | 63            | 62                 |
| 40' 7 1/16"             | 29            | 28                 | 89' 3 2/16"             | 64            | 63                 |
| 41' 11 12/16"           | 30            | 29                 | 90' 7 13/16"            | 65            | 64                 |
| 43' 4 7/16"             | 31            | 30                 | 92' 0 8/16"             | 66            | 65                 |
| 44' 9 2/16"             | 32            | 31                 | 93' 5 3/16"             | 67            | 66                 |
| 46' 1 13/16"            | 33            | 32                 | 94' 9 14/16"            | 68            | 67                 |
| 47' 6 8/16"             | 34            | 33                 | 96' 2 9/16"             | 69            | 68                 |
| 48' 11 3/16"            | 35            | 34                 | 97' 7 4/16"             | 70            | 69                 |
| 50' 3 14/16"            | 36            | 35                 | 98' 11 15/16"           | 71            | 70                 |
| 51' 8 9/16"             | 37            | 36                 | 100' 4 10/16"           | 72            | 71                 |

The Number of Bars Shown are for one side of Roof Only, as on a Leanto. When figuring quantity for an even span house (2 sides) double above quantities.

NATIONAL GREENHOUSE CO.



## LOCATION . . . .

The main offices and factory of *National Greenhouse Co.* are located in Pana, Illinois. This is 200 miles southwest of Chicago and 90 miles northeast of St. Louis. National also maintains a branch office and warehouse in Naugatuck, Connecticut. Naugatuck is 5 miles south of Waterbury and 15 miles north of New Haven.

## TRANSPORTATION . . . .

Prompt, dependable delivery is assured National Greenhouse customers from both shipping points. Pana is served by the New York Central, Illinois Central, Baltimore and Ohio, and the Chicago & Eastern Illinois railroads. Also by the following truck lines: Hayes Freight Lines, Decatur Cartage, Yellow Transit and McBride Express.

Naugatuck is served by the New York, New Haven & Hartford Railroad; and these truck lines. E. J. Kelley Co. and H. T. Smith Express in Connecticut; Holmes Transportation and Hemingway Bros. in the New England States; Dorn's Transportation in New York and points south; and Associated Transport, Inc. in New Jersey, Pennsylvania, and all points south to Florida.

Connections can be made with all major truck lines and car-loading companies for shipment throughout the country.

## GENERAL SHIPPING SUGGESTIONS . . . .

PARCEL POST provides efficient and convenient transportation of parcels up to specified limitations. If you indicate shipment by parcel post, please include postage with your order.

RAILWAY EXPRESS gives fast service as shipments are carried on passenger trains and delivered promptly upon arrival at stations where pick-up and delivery service is maintained.

FREIGHT (RAIL OR TRUCK) is recommended where speed is not essential and where weight and size limitations necessitate shipment by this method. For economy it pays to build your order up to 100 pounds or more, since there is a 100 pound minimum charge. On shipments exceeding this weight you pay only for the actual weight of the material.

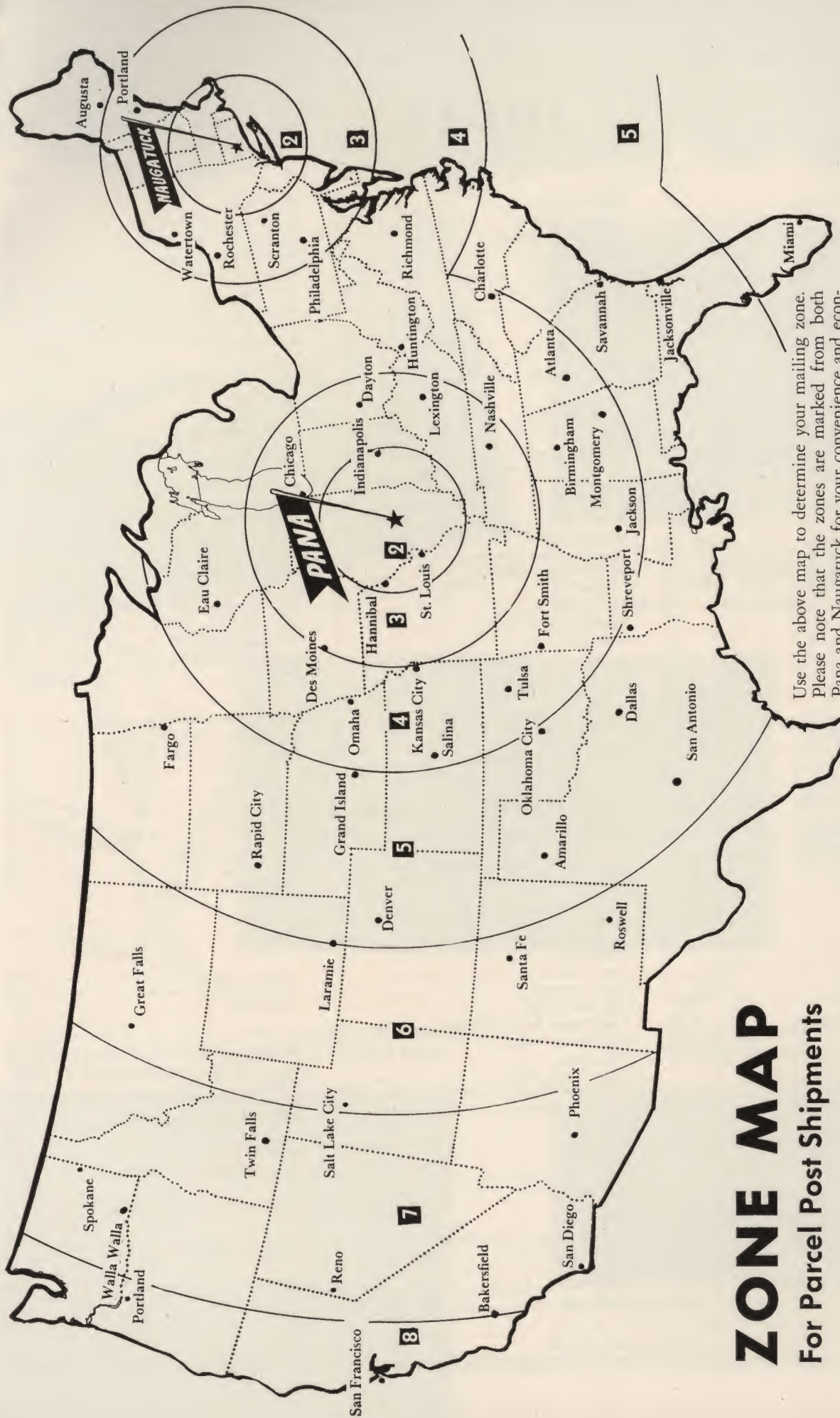
## C. O. D. SHIPMENTS . . . .

Material can be shipped C.O.D. by parcel post, truck or railroad freight, or by railway express, but in all cases the delivering carrier will charge you for collection of the material costs, in addition to the transportation charges. It is therefore to your advantage to pay for the material when it is ordered to avoid C.O.D. charges.

## PRICES AND TERMS . . . .

Prices are net, F.O.B. our factory or warehouse and subject to change without notice. Terms of sale are cash with order. Whenever possible, your order will be shipped the same day it is received.





Use the above map to determine your mailing zone. Please note that the zones are marked from both Pana and Naugatuck for your convenience and economy. Refer to the parcel post chart on the reverse side of the enclosed order blank for mailing rates.

# ZONE MAP

## For Parcel Post Shipments



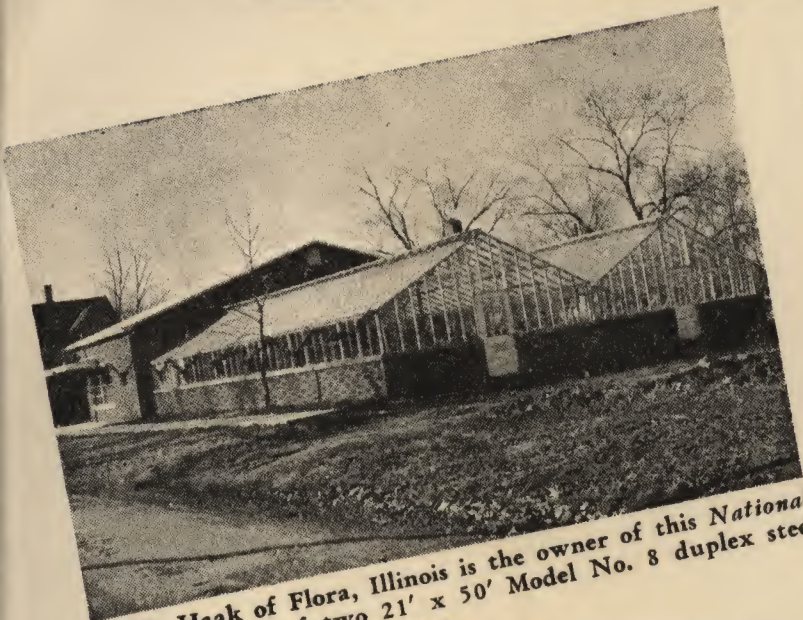
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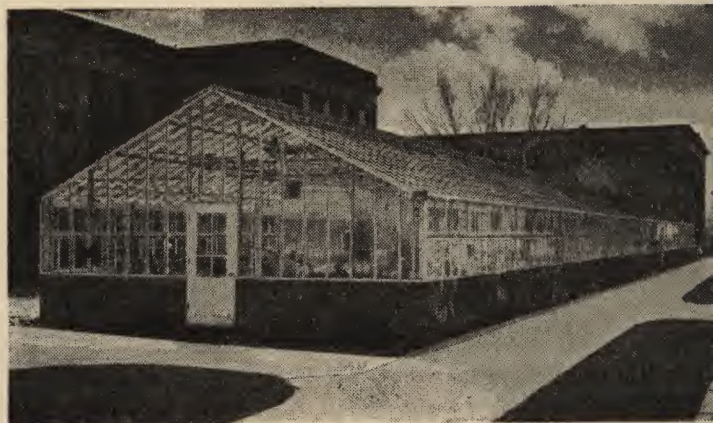


FROM COAST TO COAST

# NATIONAL INSTALLATIONS SERVE A *Growing* INDUSTRY



A. W. Haak of Flora, Illinois is the owner of this National unit consisting of two 21' x 50' Model No. 8 duplex steel gutter connected greenhouses.



A 24'6" x 167' Model No. 8 National greenhouse installed by the University of Nebraska on the campus at Lincoln. This greenhouse is divided into six separate compartments for experimental research.



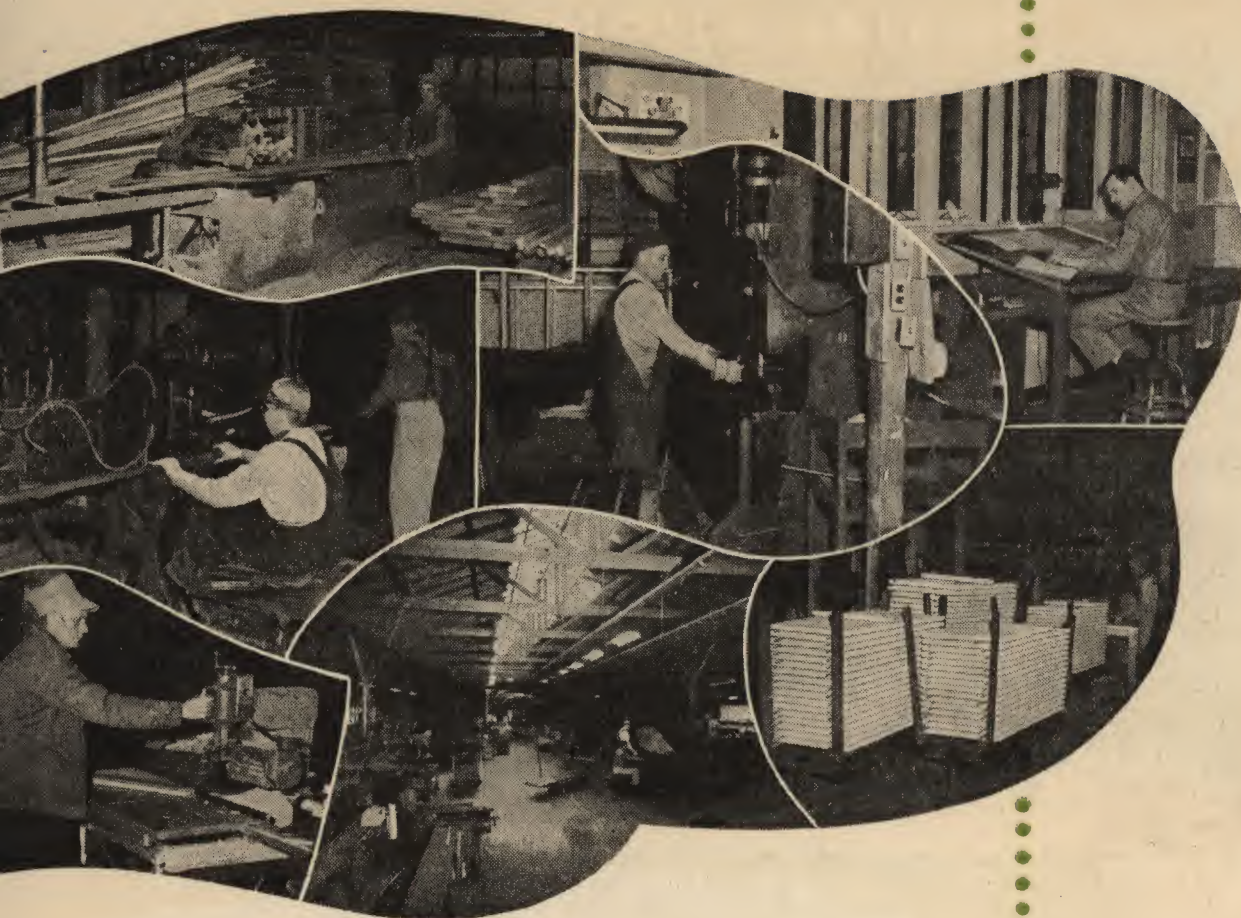
Pictured at the left is the 17' x 21' pipe frame greenhouse built for Samuel C. Porter of Atlanta, Georgia. Note the beautiful foliage in this National house.

Interior view of a 42' x 100' National standard greenhouse. Jack Van Peenen, Van Peenen's Flowers, Lansing, Michigan is the owner.



The National greenhouse shown above was built for A. L. Kurtz of the Home Garden Nursery, Palo Alto, California. It is a 17'6" x 67' Model No. 8 house.





## NATIONAL GREENHOUSE CO.

Through the years National Greenhouse Co. has been serving a growing industry with the finest in greenhouse methods and materials. Because our attempts to offer a better service have been appreciated by florists throughout the nation, we have been able to grow with the industry.

Today, National offers the same quality material, the same fine workmanship which has been our standard for so many years.

When you want the finest in greenhouse construction, designed to fit your needs and your purse, buy the best . . . by NATIONAL!

## NATIONAL GREENHOUSE CO.

PANA, ILLINOIS • NAUGATUCK, CONN.

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